

WORLD PEACE

“Free peoples ... will make war only when driven to it by tyrants. ... there have been no wars between well-established democracies. ... the absence of wars between well-established democracies [has a probability of being coincidence] less than one chance in a thousand. ... robust statistics ... When toleration of dissent has persisted for three years ... a new republic [is] ‘well established.’” – Spencer Weart, 1998



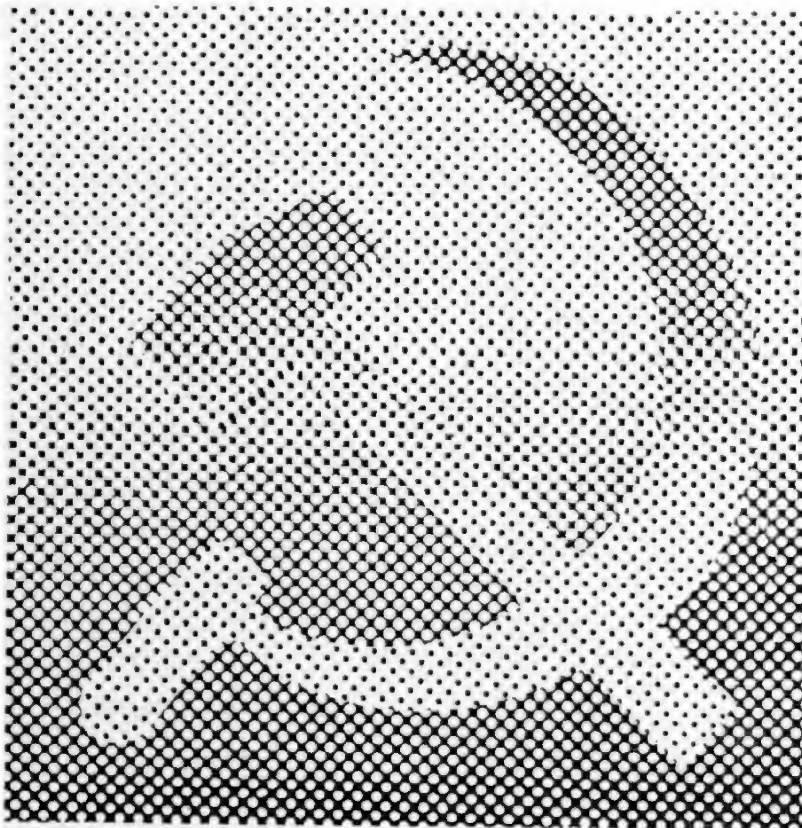
**PEACE BY NATIONAL INDEPENDENCE FOR WORLD DEMOCRACY
THROUGH FREEDOM FROM OPPRESSION BY FASCIST OR DEMOCRACY-
DILUTING TYRANT DICTATORSHIPS (TRUE NATIONAL INDEPENDENCE),
ENFORCED BY DETERRENCE MADE CREDIBLE AND EFFECTIVE BY CIVIL
DEFENCE. NOT SURRENDER TO LYING, ILLIBERAL, DISSENT-CENSORING,
FEAR-MONGERING, ELITIST, TERRORIST, COERCIVE, SCARE-MONGERING**

Spencer Weart, *Never at War: Why Democracies Will Not Fight One Another*, Yale University Press, 1998:

“This idea had been developed by 1785 ... A world where every state was a democracy, [Immanuel Kant] wrote, would be a world of perpetual peace. Free peoples ... will make war only when driven to it by tyrants. ... there have been no wars between well-established democracies. ... the absence of wars between well-established democracies [has a probability of being coincidence] less than one chance in a thousand. ... robust statistics ... When toleration of dissent has persisted for three years ... a new republic [is] ‘well established.’ ... [Diplomatic pacifism made war by the ‘appeasement trap’ of trying to ‘accommodate a tyrant.’] ... the tyrant concluded that he could safely make an aggressive response ... [thus] negotiating styles are not based strictly on sound reasoning.”

Military Psychology

A Soviet View



Edited by:
V.V. SHEL'YAG
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K.K. PLATONOV

Moscow 1972

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THE UNITED STATES AIR FORCE

ВОЕННАЯ ПСИХОЛОГИЯ

**УЧЕБНИК
ДЛЯ ВЫСШИХ ВОЕННО-ПОЛИТИЧЕСКИХ
УЧИЛИЩ
СОВЕТСКОЙ АРМИИ
И ВОЕННО-МОРСКОГО ФЛОТА**

*Под редакцией
В. В. ШЕЛЯГА,
А. Д. ГЛОТОЧКИНА,
К. К. ПЛАТОНОВА*

**Ордена Трудового Красного Знамени
ВОЕННОЕ ИЗДАТЕЛЬСТВО
МИНИСТЕРСТВА ОБОРОНЫ СССР
МОСКВА — 1972**

Chapter 28. The Psychology of Agitation and Propaganda Activity

“Propaganda” and “agitation” are words of Latin origin. To propagandize means to disseminate knowledge, ideas, views, and theories, while to agitate means to stir up definite aspirations and arouse people to action.

However, the essence of our Party and Leninist propaganda is significantly deeper. It must not only disseminate and transmit revolutionary ideas, but also make them the convictions of the people. By agitation, we mean a direct appeal and ability to direct the energy and will of the people to struggle for carrying out the ideas of communism in practice.

A scientific explanation of the essence of communist propaganda and agitation as well as their unity and differences was provided by V. I. Lenin.

V. I. Lenin in his work *Chto Delat'?* (What Is to be Done?), from the example of explaining the question of unemployment to the masses, showed the difference between propaganda and agitation: “. . . The propagandist, if he takes, for example, the same question of unemployment, should explain the capitalist nature of the crises, show the cause of their inevitability in modern society, sketch the necessity of transforming it into a socialist society, and so forth. In a word, he should provide ‘many ideas,’ or so many ideas that all these ideas at once, in their aggregate, will be assimilated by only a few (comparatively) persons. But an agitator, in speaking on the same question, takes the most outstanding example or one which is best known to his listeners . . .”

“The art of any propagandist or agitator,” stressed V. I. Lenin, “is in influencing a given audience in the best way, and making a certain truth for the audience as convincing as possible, as easy to assimilate as possible, and as visibly and strongly memorable as possible.” V. I. Lenin, *Poln. sobr. soch.*, Vol 21, p 21.

Convincingness is achieved by the propagandist's profound knowledge of theoretical problems and practical questions which he explains. A propagandist's speech is notable in its vivid exposition of the basic thought and main idea, reinforced with rich factual material, and enrichment of the listeners with new knowledge.

In propaganda, it is advisable to limit oneself in using obvious and reliable judgments, for an abundance of them frees the listener from the need to think, and teaches dogmatism.

Fourth, the words of an agitator will be convincing if and when these words are theoretically argued with sufficient profundity. The talk of an agitator is not only a conversation on current subjects, but also an explanation of a certain idea or theory. Only profound understanding of this idea by the masses will raise their revolutionary activeness which the agitator directs by his appeals in the appropriate manner. For this reason, a true agitator is a politically intelligent and ideologically convinced fighter for the Party. The best agitators are political workers, commanders, engineers, progressive-minded personnel, soldiers, and sergeants whose words are an authority for comrades.

Fifth, agitation cannot be effective if it is not capable of becoming a means for an emotional effect upon the listeners. The agitator influences the audience not only by his words, but by the entire range of his human personality, how he proves the theoretical theses, and by his tone and demeanor. The vivid and lively language of an agitator, and the most successful and intelligent form found by him for expressing an idea are important factors helping to carry out the agitation passionately and convincingly.

The observance of the listed conditions, which provide for the effectiveness of an agitator's talk, requires from him certain qualities, profound knowledge, high personal culture, combat and methodological preparation, ability to think logically, as well as the capability to come into contact with different people.





FRANK COUSINS, General Secretary of the Transport and General Workers Union, raised a unilateral nuclear disarmament motion at 1957 Labour Party Conference that was defeated by Nye Bevan as requiring the Foreign Secretary to "go naked into the conference chamber" with Russian Premier Khrushchev. In a repeat at the 1960 Labour Party Conference, Cousins defeated party leader Hugh Gaitskell.

Peace News

No. 1,090 May 17, 1957 4d. US Air Express Edition 10 cents

A SPOKESMAN OF DANGEROUS INDIVIDUALS

By Peter R. Bell, MA, FLS

Lecturer in Botany, University College London

VISCOUNT CHERWELL, war-time personal assistant to Sir Winston Churchill and a "professional physicist" attacked the campaign against the British H-test when he spoke in the House of Lords on May 8. He considered that Dr. Schweitzer and the Pope, had allowed themselves to be taken in "by the inaccurate propaganda of the friends of Russia."

"I am surprised," he said, "that men in high positions without scientific knowledge or exact information should issue appeals on scientific questions on which they are not competent to judge."

IF a biologist, no matter how eminent, made pronouncements with every show of authority about the detailed structure of atoms, he would justifiably be regarded with some scorn by physicists. This does not deter Lord Cherwell, whose speciality might be described as Engineering Physics, from posing as one qualified to assess the biological dangers of radiation.

Indeed, the very assurance with which he belittled these dangers in his notorious speech in the House of Lords, so different from the cautious and tentative conclusions which were drawn in the report of the Medical Research Council's Committee, indicates the absence of any firsthand knowledge of the problems involved.

Dangerous

What is alarming is that the Government, containing no scientists, is likely to value his pronouncements in scientific fields where his lack of training and knowledge render them worthless.

Most physicists directly concerned with nuclear research are only too anxious to learn from the biologist the possible effects of radioactivity, but there is a clear threat that the Government's policy in respect of weapons will be influenced in the main by engineers and physicists whose main interest is the verification of calculations and whose understanding of and respect for biology is negligible.

Lord Cherwell appears to have made himself the spokesman of these dangerous individuals.

Embarrassment

Pleasantries about luminous watches may entertain the students of Christ Church (where talent in biological science is not conspicuous), but they are out of place in a serious discussion of nuclear warfare.

The public will prefer to listen to biologists whose scientific objectivity is above question, rather than Lord Cherwell, who beside his scientific limitations, offers the House of Lords an admixture of technicalities and political prejudice.

Even in his own field, confidence in the

● ON BACK PAGE

The Australian Labour Party has recently expressed its belief that the present policies of the French Government in Algeria, the USSR Government in Hungary and the British Government in Cyprus are contrary to the principles of the United Nations Charter, and that self-determination for peoples capable of self-government is their right. It welcomes in contrast the creation of the new Dominion of Ghana.

The alternative to the H-bomb UNARMED DEFENCE

Investigate King-Hall's idea

—Barbara Wootton

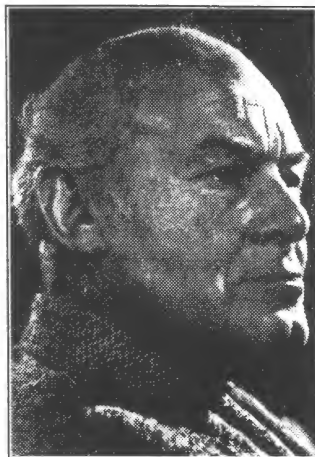


Photo: KARSH of Ottawa.
Commander Sir Stephen King-Hall

PROFESSOR BARBARA WOOTTON, Fenner Brockway, MP, Frank Allaun, MP, Anthony Greenwood, MP, and Commander Fox-Pitt, are among the leading British personalities who have in the last week endorsed Commander Sir Stephen King-Hall's call for a serious investigation of the practicality of a new British national defence policy based on reliance on unarmed resistance.

Professor Barbara Wootton, one of the leading British thinkers, writing on page 5, calls Commander King-Hall's proposal "a most significant event."

Growing evidence

Hailing "the fact that a Royal Commission on non-violent resistance has been suggested in responsible quarters," she points out that the history of reform "supports the view that what is ridiculous in one generation, is practical political controversy in the next, and may be realised in the third."

The second and third steps have now "become immensely more likely," she declares, pointing to the "growing body of evidence that organised . . . non-violence has always carried the day where it has been persistently tried."

Non-pacifist Frank Allaun, MP, also writing on page 5, calls Commander King-Hall's statement "the most remarkable, most important, most brilliant, thing I've read for a long time."

Scores of MPs are being forced by events, he writes, to the view that violence can achieve nothing, and that a few "have already discussed King-Hall's statement with admiration."

"Timely and justified"

Stuart Morris, Secretary of the Peace Pledge Union, describes the proposals as "of great significance" on page 5, calling the demand "for a full and impartial examination of a fully pacifist policy" both "timely and justified."

He emphasises the need for "a new moral approach" by the British people "which would completely change their own attitude and the whole international situation."

Anthony Greenwood, MP, told Peace News that Commander King-Hall's proposal was "an excellent idea."

● Joining the debate on the proposal next week in Peace News is Lord Altrincham, prominent Conservative spokesman in the House of Lords and Editor of the National and English Review, arguing against Commander King-Hall's proposal. Reginald Thompson, former Daily Telegraph war correspondent and author of "Cry Korea" and Fenner Brockway, MP, both non-pacifists, will write in favour of the call for serious consideration of a national defence policy of unarmed resistance.

Commander King-Hall's article was reproduced in full in last week's Peace News, copies of which are still available.

HAROLD STEELE OFF AGAIN TODAY

HAROLD STEELE is expected to leave New Delhi today, Friday, for either Tokio or Fiji en route to the Pacific H-test area.

The Emergency Committee for Direct Action against Nuclear War, with £5,000 available, are endeavouring to contact boats staying in the H-test area.

Mr. Steele finally received his visa for Japan on May 3 after some delay. On April 26 Acting Japanese Consul-General in London, Mr. Ryoze Sunobe, wrote to Mr. Steele that his application for a visa had "been carefully studied by the Japanese authorities concerned, and I am to state that the Japanese authorities are prepared to grant a visa only on your assurance that

★ ON BACK PAGE

H-tests: "the public can stop this immorality"

—MRS SHEILA JONES

THERE is still some time left before the word is given for the first British H-bomb test to take place.

The public can stop this immorality.

There IS something we can do.

It has to be done NOW.

This is the message of Mrs. Sheila Jones, Secretary of the National Council for the Abolition of Nuclear Weapon Tests*, whom I interviewed on Monday.

Just as a strong show of public disapproval with the Government's policy over Suez was instrumental in stopping war there, so would sufficient public opinion against the tests succeed in preventing them, believes Mrs. Jones.

*29 Gt. James St., London, W.C.1.



On the plinth of Nelson's Column in Trafalgar Square last Sunday at the Stop the H-test meeting: Dr. Edith Summerskill, Mrs. L. John Collins (standing), Vera Brittain (seated), Shiela Steele at microphone and Mrs. Sheila Jones (standing).

More pictures and report on page 6.

PEACE NEWS journal had been set up to appease the Nazis in 1936. In 1957 it was again exaggerating weapons effects (no longer gas bomb lies, but nuclear lies) and ignoring civil defence, as in 1936. It promoted "unarmed defence", insulting WWII holocaust memories. It was Peace News which set up first London-Aldermaston march.



NUCLEAR DISARMAMENT

MASS MEETING

CENTRAL HALL WESTMINSTER

Michael Foot
Stephen King-Hall
J.B. Priestley
Bertrand Russell
A.J.P. Taylor

CHAIRMAN: Canon L. John Collins

MONDAY 17 FEBRUARY 1958

SEE FAMOUS INTELLECTUALS J. B. PRIESTLY AND BERTRAND RUSSELL, ENTRY TICKETS ONLY 6 PENCE!
3,000 tickets were sold for CND's inaugural meeting, 17 February 1958, Central Hall Westminster



April 21, 1959 Cuban President Fidel Castro and Vice President Nixon



June 3, 1961: Nikita Khrushchev and John F. Kennedy in Vienna

CIA 12 March 1962

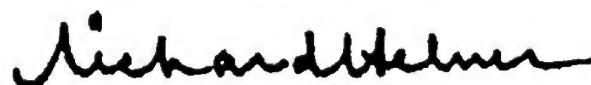
12 MAR 1962

MEMORANDUM FOR: The Director of Central Intelligence

SUBJECT : MILITARY THOUGHT: "Some Factors Affecting the Planning of a Modern Offensive Operation", by Colonel-General Ye. Ivanov

1. Enclosed is a verbatim translation of an article which appeared in the TOP SECRET Special Collection of Articles of the Journal "Military Thought" ("Voyennaya Mysl") published by the Ministry of Defense, USSR, and distributed down to the level of Army Commander.

2. In the interests of protecting our source, this material should be handled on a need-to-know basis within your office. Requests for extra copies of this report or for utilization of any part of this document in any other form should be addressed to the originating office.



Richard Helms
Deputy Director (Plans)

Following is a verbatim translation of an article titled "Some Factors Affecting the Planning of a Modern Offensive Operation", written by Colonel-General Ye. Ivanov.

This article appeared in the 1960 Second Issue of a special version of Voyennaya Mysl (Military Thought) which is classified TOP SECRET by the Soviets and is issued irregularly.

* * *

Weakening the nuclear strength of an opposing grouping of the enemy and depriving him of his capability to use nuclear weapons is one of the most important tasks, whose correct solution ensures the success of the offensive operation as a whole.

* * *

The mass utilization of nuclear weapons in short periods of time is the only way to achieve decisive destruction of the fire power of an opposing enemy grouping, destruction of his main nuclear/missile and aviation means, and also disruption of the control of troops and the disorganization of work of the rear services.

S E C R E T

Extracts from Khrushchev's letter
to Kennedy, 26 October 1962
(Catalogue ref: PREM 11/3691)

QUOTE

Dear Mr. President:

I have received your letter of October 25. From your letter, I got the feeling that you have some understanding of the situation which has developed and (some) sense of responsibility. I value this.

Now we have already publicly exchanged our evaluations of the events around Cuba and each of us has set forth his explanation and his understanding of these events. Consequently, I would judge that, apparently, a continuation of an exchange of opinions at such a distance, even in the form of secret letters, will hardly add anything to that which one side has already said to the other.

I think you will understand me correctly if you are really concerned about the welfare of the world. Everyone needs peace: Both capitalists, if they have not lost their reason, and still more, Communists, people who know how to value not only their own lives but, more than anything, the lives of the people. We, Communists, are against all wars between states in general and have been defending the cause of peace since we came into the world. We have always regarded war as a calamity, and not as a game nor as a means for the attainment of definite goals, nor, all the more, as a goal in itself. Our goals are clear, and the means to attain them is labor. War is our enemy and a calamity for all the peoples.

It is thus that we, Soviet people, and, together with us, other peoples as well, understand the questions of war and peace. I can, in any case, firmly say this for the peoples of the Socialist countries, as well as for all progressive people who want peace, happiness, and friendship among peoples.

I see, Mr. President, that you too are not devoid of a sense of anxiety for the fate of the world, of understanding, and of what war entails. What would a war give you? You are threatening us with war. But you well know that the very least which you would receive in reply would be that you would experience the same consequences as those which you sent us. And that must be clear to us, people invested with authority, trust, and responsibility. We must not succumb to intoxication and petty passions, regardless of whether elections are impending in this or that country, or not impending. These are all transient things, but if indeed war should break out, then it would not be in our power to stop it, for such is the logic of war. I have

participated in two wars and know that war ends when it has rolled through cities and villages, everywhere sowing death and destruction.

In the name of the Soviet Government and the Soviet people, I assure you that your conclusions regarding offensive weapons on Cuba are groundless. It is apparent from what you have written me that our conceptions are different on this score, or rather, we have different estimates of these or those military means. Indeed, in reality, the same forms of weapons can have different interpretations.

You are a military man and, I hope, will understand me. Let us take for example a simple cannon. What sort of means is this: offensive or defensive? A cannon is a defensive means if it is set up to defend boundaries or a fortified area. But if one concentrates artillery, and adds to it the necessary number of troops. Then the same cannons do become an offensive means, because they prepare and clear the way for infantry to attack. The same happens with missile - nuclear weapons as well, with any type of this weapon.

You are mistaken if you think that any of our means on Cuba are offensive. However, let us not quarrel now. It is apparent that I will not be able to convince you of this. But I say to you: You, Mr. President, are a military man and should understand: Can one attack, if one has on one's territory even an enormous quantity of missiles of various effective radiuses and various power, but using only these means? These missiles are a means of extermination and destruction. But one cannot attack with these missiles, even nuclear missiles of a power of 100 megatons because only people, troops, can attack. Without people, any means however powerful cannot be offensive.

Armaments bring only disasters. When one accumulates them, this damages the economy, and if one puts them to use, then they destroy people on both sides. Consequently, only a madman can believe that armaments are the principal means in the life of society. No, they are an enforced loss of human energy, and what is more are for the destruction of man himself. If people do not show wisdom, then in the final analysis they will come to a clash, like blind moles, and then reciprocal extermination will begin.

Let us therefore show statesmanlike wisdom. I propose: We, for our part, will declare that our ships, bound for Cuba, will not carry any kind of armaments. You would declare that the United States will not invade Cuba with its forces and will not support any sort of forces which might intend to carry out an invasion of Cuba. Then the necessity for the presence of our military specialists in Cuba would disappear.

APRIL FOOLS DAY →

Thin march towards future

A FEW PEOPLE are still left in this country who have not learned how to live with the Bomb, and yesterday about 700 of them set off from Trafalgar Square for the Atomic Weapons Research Establishment at Aldermaston, Berkshire.

They marched behind the banner used in the first CND march in 1958.

It was a pitifully small crowd by 1963 standards, when an estimated 100,000 packed into the square for the end of that year's march. But, according to the CND general secretary, Mr Dick Nettleton, who is used to parrying questions about the decline of CND: "It means something that CND is still there. It is still marching."

In any case, he argues, CND, does its work now in

quieter and more effective ways. It has, he claimed yesterday, more widespread connections now with trade unions and the Labour Party than it had in 1963, when it was at the height of its success. "In three years, we may have the Labour Party again," he said, "and this time we'll keep it."

The campaign's hope, he implied, is that nuclear weapons will once again become a live issue when the present Government, or the next, has to make a decision to replace or upgrade the present Polaris force. Either the purchase of Poseidon from the United States, or an attempt to create a European nuclear force with the French would make the bomb a central issue again. Then, it is argued, CND would be able to act effectively.

By MARTIN WOOLLACOTT

For the moment, however, the Bomb remains low on the list of protest issues—lower than pollution or the Irish Question. None of the big names turned up at the rally to start the march and only one MP was around, although it was hoped some others might join during the three-day march to Aldermaston. This year, the march is very specifically a return to CND's origins, for it is the first year since 1958 that it has gone from London to Aldermaston, instead of the other way round.

Aldermaston, Mr Nettleton told the marchers, is "still the place where they are working overtime to improve the wretched Bomb, to make it move faster, to make it kill more people."

Down in the crowd of wait-

ing marchers, Paul Haines, aged 16, from a Birmingham grammar school, stands holding a placard which reads "No European Bomb." Why has he come? "We don't want the H-bomb," he says. Well, neither do a lot of people, but they're not here in Trafalgar Square. "We don't want the H-bomb," he repeats, with slightly more emphasis.

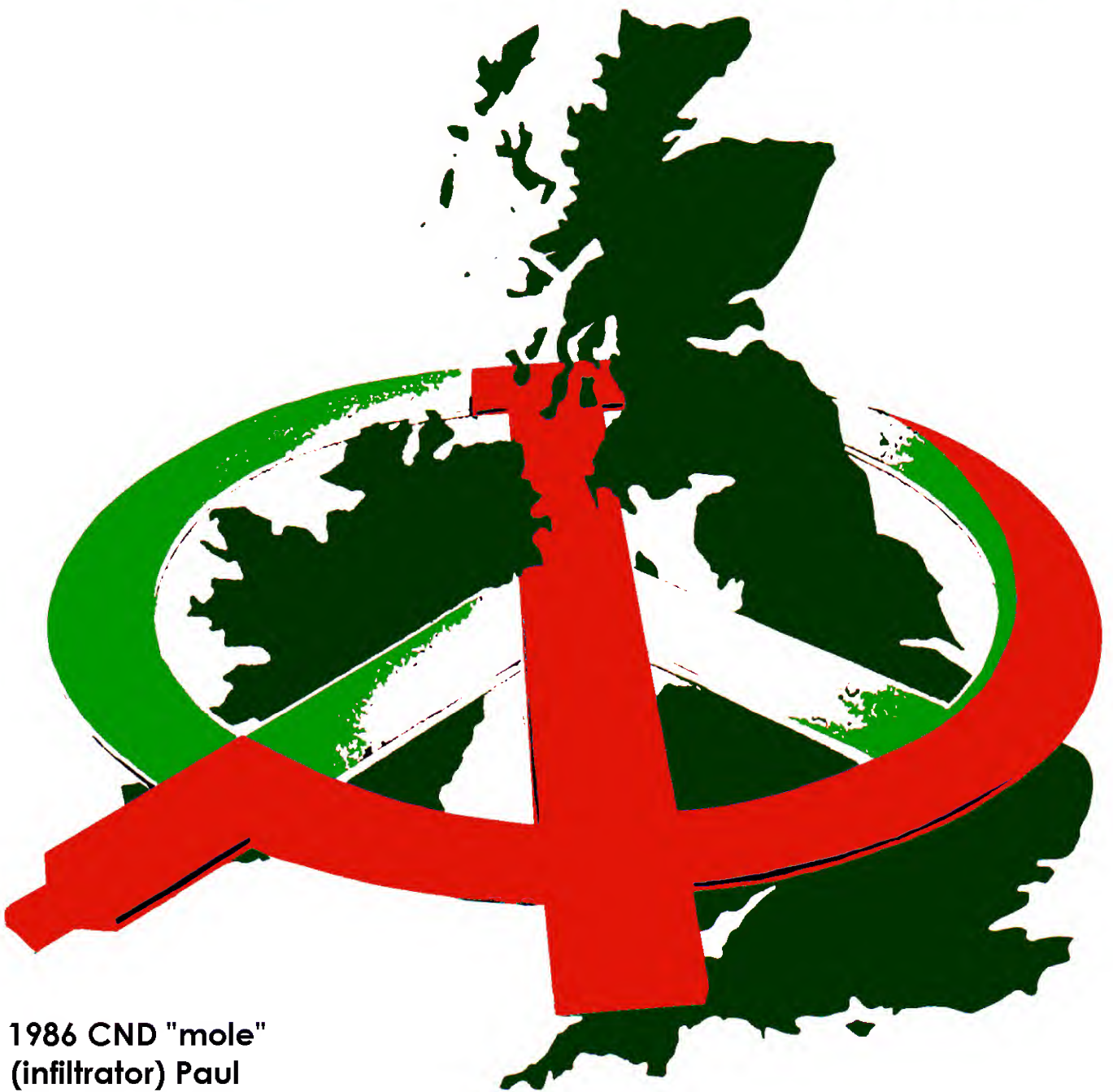
Gay Liberation is there, smarter than almost anybody else. "Gay Liberation isn't a narrow, chauvinistic group just for gay people—we're part of the people who want to change society as a whole," an organiser said. "Most gay people must be against the bomb: gay people know what it's like to be oppressed."

Mrs Bridget Wright, an attractive 50-year-old, says it is her eleventh year on the march. Of course, CND has declined, she says: "So many other causes have grown out of it, they have diverted energy away from it. But protest on so many issues has grown out of what we started."

March ban may be lifted

GUARDIAN NEWSPAPER promoting anti-nuclear dogma for "Gay Liberation" (ignoring the Russian disposal of gays in invaded countries)

'PEACE' OF THE DEAD



1986 CND "mole"
(infiltrator) Paul
Mercer exposed
USSR propaganda

Paul Mercer

Foreword by Lord Chalfont, OBE, MC, PC

"I personally need no lessons on how to combat 'anti-Sovietism' in the peace movement from armchair peace campaigners. The consistent stand of CND for unilateral nuclear disarmament and withdrawal from NATO has been won by working as Communists in a principled non-sectarian way."—CND Vice-President, John Cox
Morning Star, 8 January 1985

Paul Mercer, who graduated from Nottingham University in 1982, is a political research consultant and author of several specialist books on military aviation.



The author (*left*) with one of his 'sources', Mgr Bruce Kent—former General Secretary of the Campaign for Nuclear Disarmament.

"I don't condemn the IRA bombings in public—I explain that they are a direct response to British policy—in some situations it's not useful to preach pacifism."—CND Council Member, Pat Arrowsmith
Socialist Challenge, 4 June 1982

HESELTINE 'EXPOSES' CND LEFT

By **JAMES WIGHTMAN** *Political Correspondent*

MR HESELTINE, Defence Secretary, has written to all Conservative candidates in marginal constituencies giving them advice on how to respond to the Campaign for Nuclear Disarmament during the General Election campaign.

He has also given biographical details of leading CND personalities, drawing attention to some links with the Labour and Communist parties.

"I think you should welcome this because the announcement has revealed the true nature and purpose of CND," he writes. The letter goes on:

By their own act they have clearly revealed what up to now has always been for some a matter of doubt.

They are an organisation led and dominated by Left-wing activists ranging through the Labour Party to the Communist Party.

Many people attracted to the peace movement will just not want to believe that behind the carefully-tuned phrases about peace lies the calculating political professionalism of full time Socialists and Communists.

"That purpose is the advance of the Socialist and Communist cause. At its most extreme it is to argue the cause of the Soviet Union at the expense of the free societies of the West."

CHAIRPERSON: Joan Ruddock, Labour Parliamentary candidate 1979;

VICE-CHAIRPERSONS: Michael Pentz, Communist party candidate in the local government election, 1950s; Roger Spiller, associated with the International Socialists.

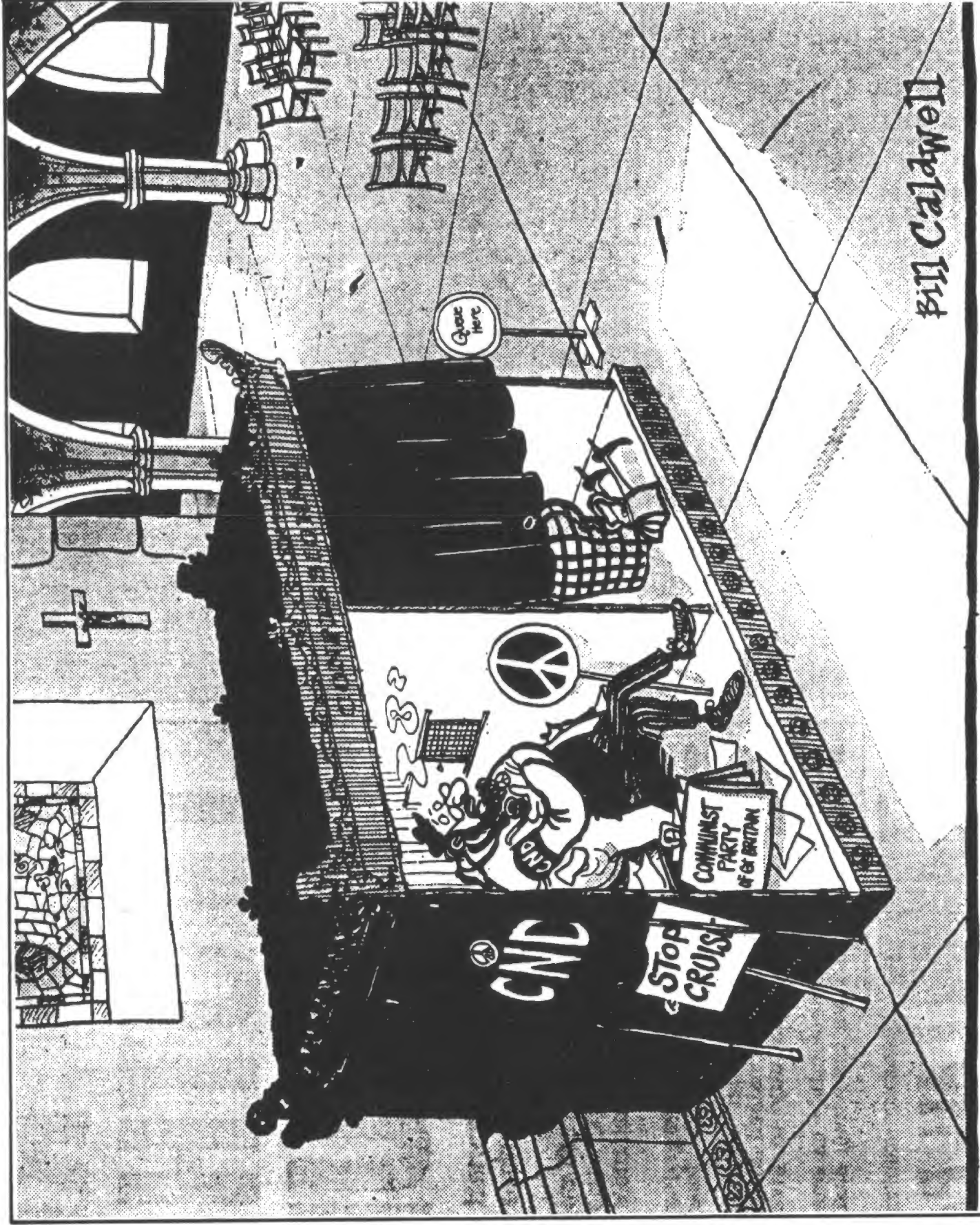
TREASURER: Mick Elliott, executive committee member of Sheffield district Labour party.

Mr Heseltine added, "These 14 people constitute a clear majority of the total members of the National Council of CND including officers, elected last November, who number 26.

"In addition, three people who failed to get elected to the National Council in 1982 are now regional delegates of CND."

The Prime Minister gave the defence portfolio to Mr Heseltine earlier this year because she wanted someone who she felt could effectively counter CND and Labour with its unilateral disarmament policy.

THE TIMES, 1983 (extract)



"Monsignor Kent is out but he asked me to take a message"



POLITBURO

BORIS PONOMAREV



POLITBURO

BORIS PONOMAREV
(Candidate member)

CENTRAL COMMITTEE
OF THE SOVIET COMMUNIST PARTY
BORIS PONOMAREV
(Secretary)

INTERNATIONAL DEPARTMENT

BORIS PONOMAREV
(Head)

OLEG KHARKHARDIN
(Vice-President of Soviet
Peace Committee)

WORLD PEACE COUNCIL

ROMESH CHANDRA
(President)

OLEG KHARKHARDIN
(Vice-President of Soviet
Peace Committee)

INTERNATIONAL LIAISON FORUM OF PEACE FORCES

ROMESH CHANDRA
(Chairman)

OLEG KHARKHARDIN
(Executive Secretary)

ARTHUR BOOTH
(Vice-Chairman)

SEAN MacBRIDE
(Vice-Chairman)

CND

BRUCE KENT



(member body)

INTERNATIONAL PEACE BUREAU

ARTHUR BOOTH
(Chairman)

SEAN MacBRIDE
(President)

BRUCE KENT
(Vice-President)

(member body)

CAMPAIGN FOR NUCLEAR DISARMAMENT

BRUCE KENT
(General Secretary)

SEAN MacBRIDE
(Irish CND Committee)

World Peace
Council President
Romesh Chandra,
Lenin Peace Prize
winner:

"There is a wrong
idea that détente
means lessening the
struggle ... détente
means the
intensification
of the struggle ..."

- Sunday Chronicle,
19 December 1976

One of the CND's many links with the World Peace Council in 1983

Sean MacBride is a former IRA Commander
awarded a Lenin Peace Prize and a Nobel



Boris Ponomarev, Politburo

(b 1905, Red Army 1919, Central C. 1956, Politburo 1972)
Head of the International Department, CCCP
Propagandarist inventor of détente appeasement

Boris Ponomarev was author of the books "The Great Vital Force of Leninism" and "The Liberation Movement", both Russian propaganda publications sent directly by the International Department of the Politburo to the British National Union of Teachers (NUT) as direct infiltration of Britain's schools. (Sources: John Izbicki, Daily Telegraph, 18 May 1981; Pincher, "The Secret Offensive")
Result: NUT's "Teachers for Peace" anti-nuclear lobby for pro-détente school fiction, like "Z for Zachariah".

HOW MOTHERS LIKE ME ARE DRIVEN TO JOIN THE BIG PEACE DEMOS

SO were you there on October 22? Were you one of the huge crowd of 250,000 demonstrators thronging Hyde Park?

And if you were not there, did you feel a little bit guilty about it? Did some of that magnificent pre-rally CND propaganda get to you?

Because it was indeed powerful propaganda. On Friday morning, the day before the demos, I and other mothers were delivering our tiny sons and daughters to their North London primary school.

This humdrum, happy, chattering little scene in the sunshine was briefly overshadowed by a sudden glimpse of apocalyptic terror in the form of two leaflets handed out to us at the gates.

Horrors

The first said: 'October 22. Where will you be?' The second, from the Camden Labour Party, told us why we should be there on Saturday. Cruise missiles, due to be installed in December, will 'make nuclear war more likely. . . .'

And just in case we mothers were to preoccupied juggling with push-chairs and shopping-bags to understand the implications of that, the leaflets told us what would happen if a one megaton bomb was exploded over Trafalgar Square.

We live in the 'area north of London Zoo up to Hampstead Heath' and that would mean, among other horrors, '50 per cent. dead from blast (ruptured guts, crushed bones).'

It didn't of course mention that the Soviets already have over 350 SS20s installed, each with three warheads, two-thirds of which are targeted on Western Europe. Information like that might 'confuse' us mothers outside the school gates.

Nor did it mention that most members of unofficial peace groups in Eastern Europe — those not controlled for propaganda purposes by the Soviet authorities — are bitterly opposed to the unilateralist and neutralist ideas of CND.

These Eastern Europeans know the realities of Soviet power, and they know that the West can only hope to succeed in disarmament negotiations if it negotiates from a position of strength.

The message handed out at the school gates had to be kept 'unconfused' by such 'irrelevant' facts.

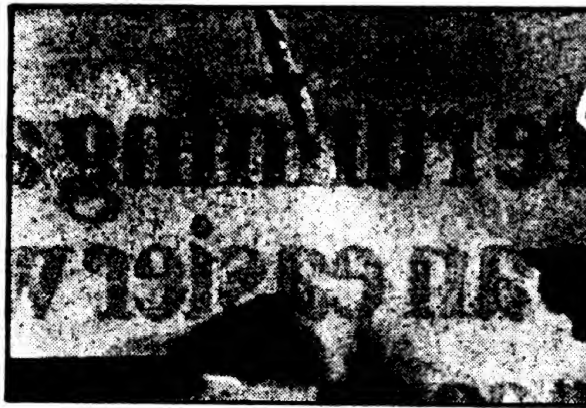
And so, yes, those leaflets did have a powerful emotional kick. As I watched my adored little five-year-old cheerfully hurrying into class with her best friend, I felt a sudden lurch in my stomach.

Those two merry little souls, millions of innocents like them — 'ruptured guts, crushed bones'. Please God, no!

Declined

So why didn't I join that march on Saturday? Don't I care?

Well, it so happens that I was there—not as a demonstrator but as an observer. I was making a film report for Channel 4 on the demonstration which CND now claims is 'proof' that the peace movement has not lost its battle.



The Cruise missile . . . target for CND fairytales. And (right) a concerned mother on the march.



This CND blackmail at our school gates . . .



by ANN
LESLIE

I had assumed that everyone in that crowd on Saturday actually knew what they were demonstrating about. But did they?

Oh sure, they were, as everyone told me earnestly, demonstrating 'in favour of peace and against nuclear war'. Well, you'd have to be criminally insane not to be in favour of peace and against nuclear war. So let's try to take it beyond the infants' class level.

No use pointing out that public opinion as expressed by the people of Hungary, East Germany, Czechoslovakia, Poland and Afghanistan has only influenced the Kremlin into greater spasms of repression and cruelty.

Destroy

Presumably most of those at the demonstration were convinced by CND's propaganda

Nor is there any illusion at NATO or SHAPE headquarters (where last week I sat through many discussions with men with titles like Head of Nuclear Planning) that America could fight a limited nuclear war in Europe.

As General Rogers, the American Supreme Allied Commander, Europe, said: 'The Soviets have said that any American weapon system being fired at Soviet soil will be cause for her to attack the United States with strategic weapons.'

How many of the people in that crowd of 250,000 have been told any of this by CND? Very few.

Alas, some of them didn't even seem to know the difference between 'unilateralist' and 'multilateralist'. One nice, earnest young man told me he was there because he was a 'multilateralist'.

Outbreak

But this, I pointed out, was a demonstration in favour of 'unilateralism'. His response was a look of utter bafflement.

Many in the crowd used the demonstration to promote a whole variety of separate causes. Like the seller of the *Hard-Left* newspaper who told me we must 'defend the Soviet Union against Western imperialism'.

Like those who wanted solar heating in homes. Like the Hare Krishna people who said that meat-eating was the cause of nuclear war.

And like the Greenham women, who were collecting money to finance a 'permanent' peace headquarters.

Not so long ago, they were telling me that the arrival of the first Cruise missile would mean the outbreak of nuclear Armageddon. Since the end of the world is nigh in a few weeks, it seemed odd, to say the least, to ask for money to set up a 'permanent' headquarters.

So all of you who might have felt a twinge of guilt about not being there on October 22 — forget it. The majority of those who were there were well-meaning, hopelessly muddled, easily exploited people.

1983
Daily Mail

This battle for your child's mind

The fact is that most parents, throughout the country, would be horrified if they realised how, even in the basic routine subjects, such as English, History and Science, their sons and daughters are being indoctrinated.



Take a look at the methods employed in sample lessons in at least

one school:

An English lesson is based on how the language of the nuclear age is used by the media to condition ordinary people into accepting Cruise missiles.

Then the teacher takes a headline from the sports pages: 'Hammers massacre Coventry in five-goal blitz.' He uses it as the starting point for a discussion which moves on to deplore the way newspapers and TV glory in war and distort the views of those who believe in peace.

Science, before lunch, is easier. The Physics master, in defiance of a request from the Minister of Education, gives the pupils the full benefit of his personal conviction that American possession of a nuclear arsenal is a one-way suicide trip for mankind.

History, in the 'afternoon, is a study, through books supplied to the school by Novosti, the Soviet Press agency, of Russia's peace-loving intentions over the last 30 years, compared with Western war-mongering.

A fantasy? Not the sort of school you would dream of letting your child attend?

No It is fact. And you might soon have no choice but to send your child to such a school.



For there is at least one comprehensive school in Britain where each one of those sample lessons—or ones similar—has already taken place. And there are at least a dozen major local



by Rodney Tyler

In Britain's biggest teachers' union, the National Union of Teachers, more than 10 per cent. of delegates at the annual conferences come from just one of the extreme Left-Wing groups operating within the educational system.

But what he feared most of all was the attempt by the notorious Inner London Education Authority to foist on him those that were politically in line with its far-left leadership.

This school year he will be ordered to give more status to

released for special courses in how to combat racism.

Another London head described a visit from one of the proliferating 'advisers' who demanded to know why Irish politics, history, literature, and music were not being taught to the Irish children in his school.



The visitor accused him of 'not co-operating' when he pointed out that he had 30 different nationalities in the school and if he discriminated in favour of one minority he would have to favour them all.

But he sees as far more sinister the question he and ILEA's 170 comprehensive heads were forced to answer recently: 'Do you recognise the role of the "hidden Curriculum" in political education?'

He told me: 'It was rather like being asked if I had stopped beating my wife. If I said yes it would have meant that I was secretly indoctrinating my children, if I said no it meant I was refusing to do so. Either way I would be open to attack.'

The hidden curriculum is another way, in Left-Wing eyes, of influencing children. Put bluntly, it means taking every opportunity as it arises in normal lessons to put across your political message.

It is this sinister move, which ILEA—Britain's biggest authority—is poised to introduce. Thus, both overtly and covertly they plan a massive programme of indoctrination.

Printed advice on how to get rid of uncooperative heads which circulates secretly among some of these groups includes such gems as:

- Hold sudden meetings at the most difficult times for the head and his staff.
- Prolong meetings unnecessarily and harass officials of the Board into resignation — then put your own people into their positions.

CND: IS IT ALL A RUSSIAN CON TRICK?

BY MARJORY DAVIDSON

THE 19 Very Important Visitors were welcomed to Moscow in the style of Heads of State.

Police escorted their motorcade as it swept through red lights on the way from Sheremetyovo Airport to a downtown hotel.

Visits to the Bolshoi Ballet, the old Czarist capital, Leningrad and the fabied cities of Tashkent and Samarkand were on the programme.

And it was red carpet treatment all the way.

The cost of this 10 day jaunt? Nothing—save the £190 cut-price air fare from London.

Who were the lucky 19? Not pop stars, or soccer players or even astronauts.

They were members of the Campaign for Nuclear Disarmament and fellow sympathisers. Lord Brockway, co-

**Moscow's making
fools of our ban
the bomb brigade**

chairman of the World Disarmament Campaign, led the party which included respected pacifists Dr Malcolm Dando, of Bradford University's School of Peace Studies, Richard Keeble, editor of The Teacher, and Father Owen Hardwicke, of Lay Christi, the Roman Catholic lobby.

They had come to Moscow to talk peace.

But like the hundreds of thousands of ban-the-bomb marchers through-

out Europe, they were and are, tragically, just dupes.

They are part of a campaign that is orchestrated and financed by the Soviet Union with the direct purpose of weakening the West, her resolve and her strength, while Russia continues to build up the most fearsome military machine in history.

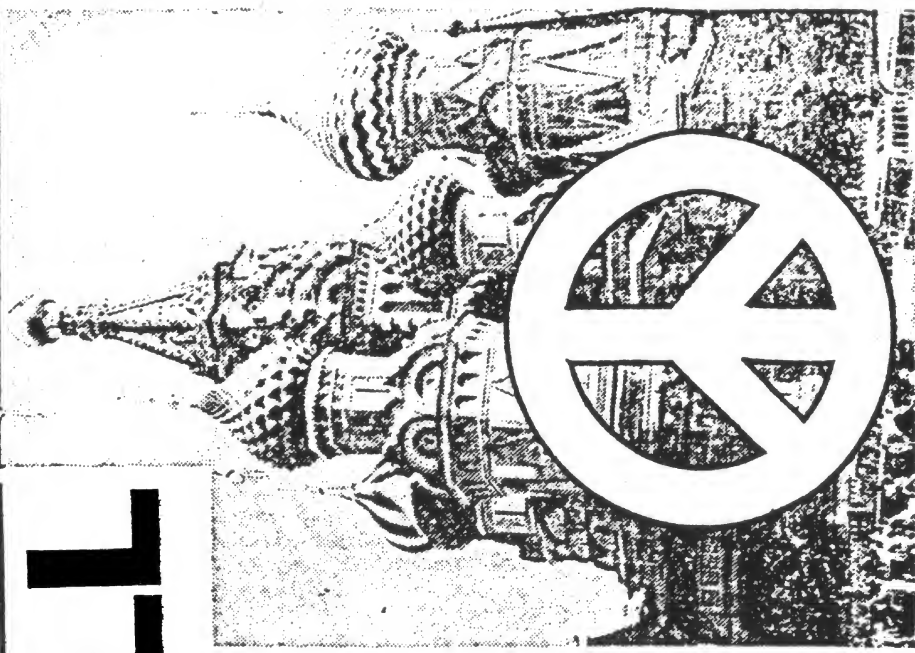
Take that starry-eyed journey last March. The Russians quickly showed

their visitors that they wanted others to talk about peace. They want others to disarm.

The naive band of travellers were campaigning for Britain to scrap all nuclear weapons. When they hesitantly asked the Kremlin to make a possible ten per cent reduction in its nuclear arsenal, the reply was a brutal "Niet."

In Britain, the ban-the-bomb campaign is booming. Membership has increased from 3,000 to 37,000 in 18 months and includes many idealistic young people. In October, more than 100,000 people from all over Britain attended the biggest demonstration in London since the heady days of the Sixties.

**LEFTIES WHO RUN
PEACE CAMPAIGN**



Brezhnev flew from Moscow to meet the 1,000 Soviet-subsidised delegates in Sofia.

Labour MPs present included Roy Hughes (Newport), James Lamond (Oldham East), Andrew Bennett (Stockport North), William Wilson (Coventry SE), and Alf Lomas (Euro MP London NE).

Alex Kitson, executive officer of the Transport and General Workers' Union, was also among the guests.

In Britain, as CND membership has grown, a Left-wing takeover has emerged, he says. Idealists have been replaced by militants with

potent Euro-Communist connections.

They seek a power base in Britain. They aim to get it by exploiting the fear and horror felt by decent men and women at the idea of nuclear war.

They have formed special sections — Youth CND and Christian CND — to extend their sphere of influence.

They are especially active in trying to persuade trade unions to affiliate to CND.

These are the facts to remember when you are impressed by lovers on the hazy Moscow-style.

In the nuclear election



vote for them.

**You can influence
the Nuclear Arms question.**

On June 9... It's your choice



CND 'HOLDING HANDS WITH IRA'

by Bob Graham

POLICE angrily criticised spontaneous CND demonstrators in London today for "holding hands with the IRA bombers."

Two anti-Cruise demos were held—at Trafalgar Square and in the Mile End Road in East London—to protest against the redeployment of nuclear missiles from Greenham Common.

Culpable

But more than 200 police officers who had been called into central London to boost the watch for terrorist bombers were immediately reassigned to handle the surprise demonstrations.

A police inspector at Trafalgar Square said: "These people are not helping their cause at a time like this. They are taking away the effectiveness of drafting in extra resources to combat the bombers."

"We are here watching these people demonstrate rather than doing the job we should be. If another bomb goes off in Central London these people can be held culpable. They are simply holding hands with the bombers."

The CND said the protest

of us all."

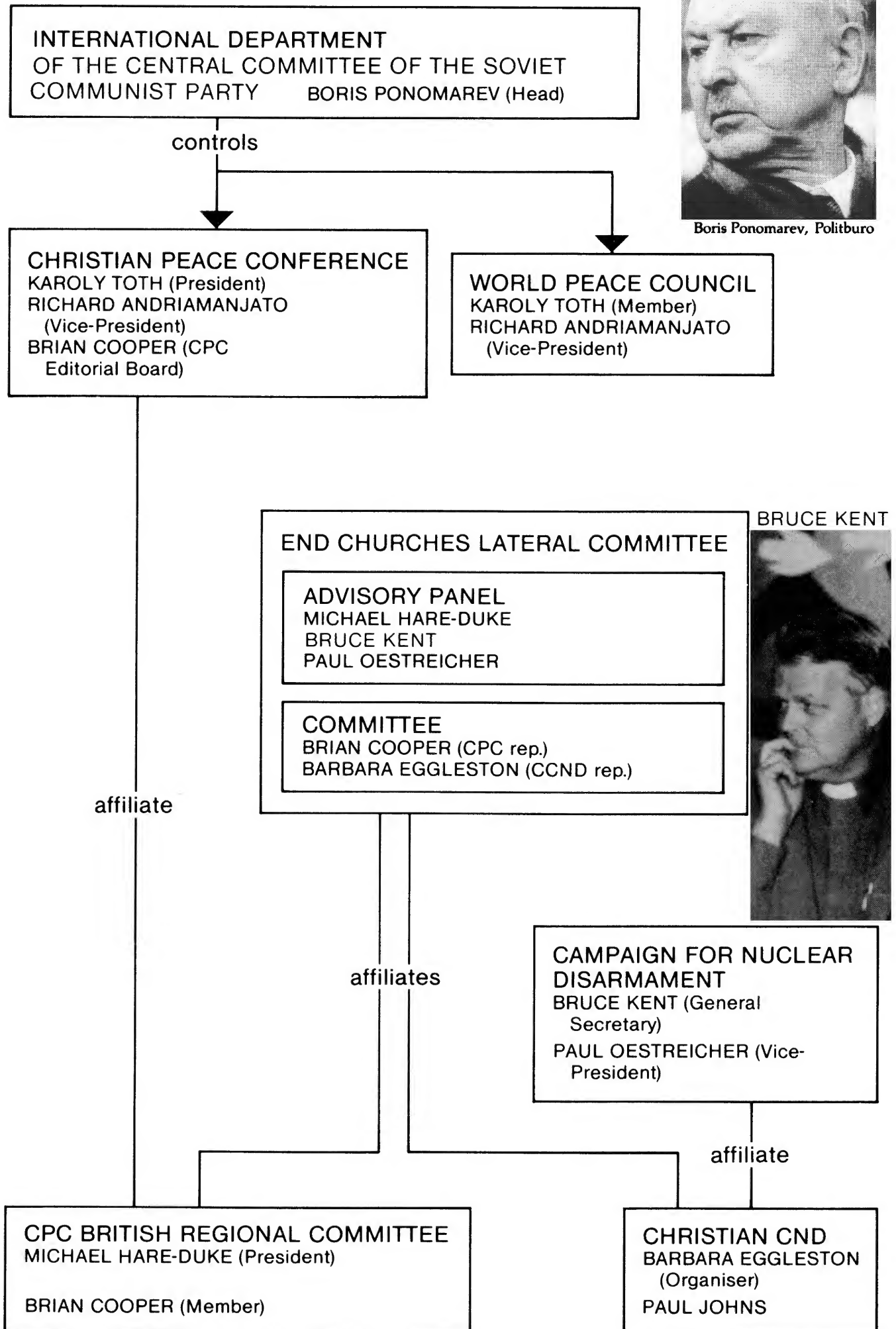
The organisers did not give police details of their plans. The heavy presence of nearly 150 officers at Trafalgar Square prevented the CND marching along Whitehall. As they gathered for the three-hour protest they were warned they could be arrested

because they did not have permission to hold the demonstration.

At Mile End, 15 people who halted traffic were arrested. Twelve women and three men lay down in the west-bound carriageway and blocked the road for nearly 25 minutes.

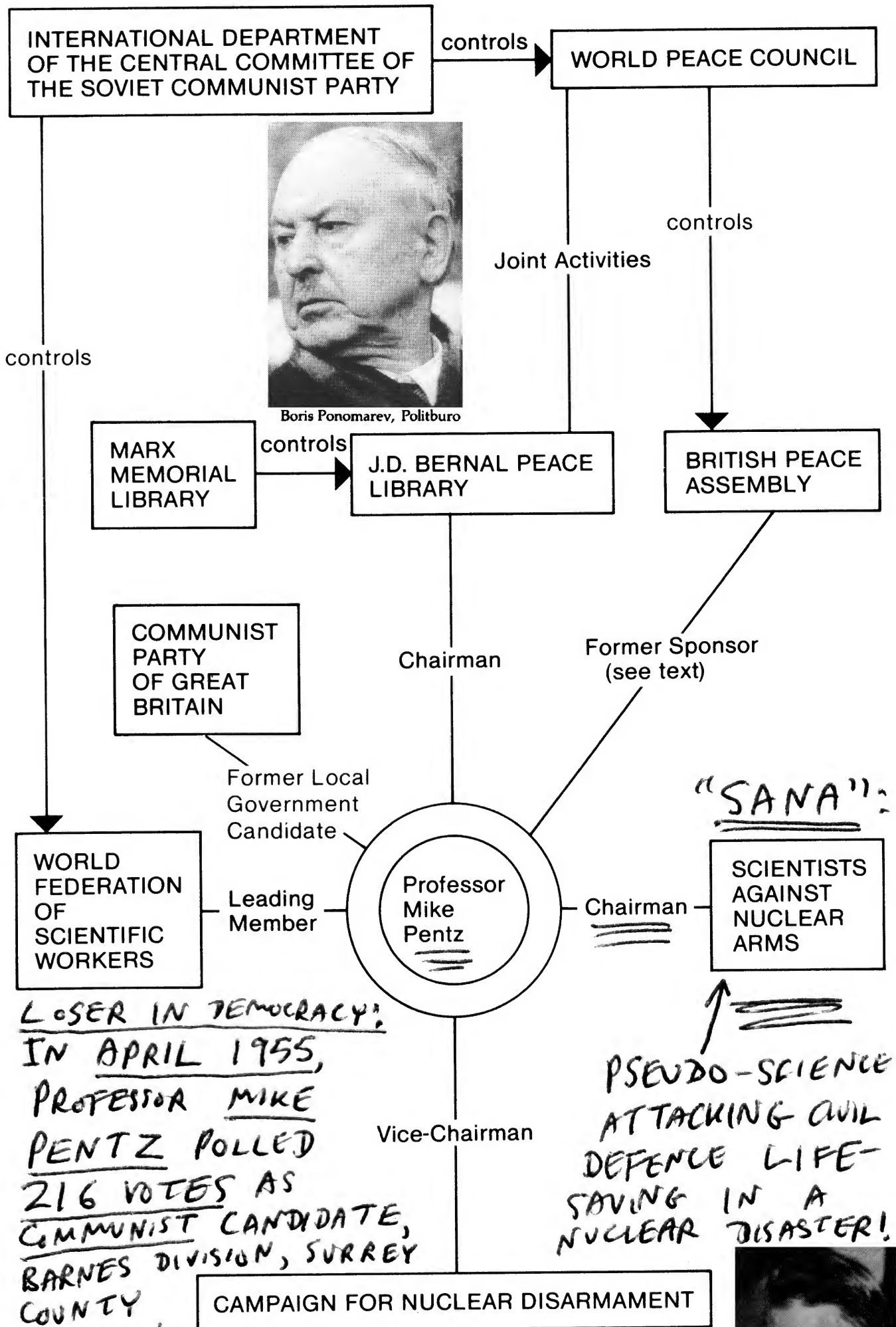


Boris Ponomarev, Politburo





Elitist academic professional dictators, SANA nuclear weapons effects propagandarists. Far left: "theoretical physicist" Professor Tom Kibble 6 June 1982.



Pentz and the 'Peace' Network in 1983

PREFACE

In Easter 1960, some two years after the foundation of the Campaign for Nuclear Disarmament, the novelist Constantine Fitzgibbon published *When the Kissing had to Stop*—a work of fiction which nevertheless infuriated supporters of the CND. It set out the possible consequences of a future Labour government carrying out unilateral nuclear disarmament, culminating in Britain's occupation by Soviet forces. The novel was meant to be political, and was predictably branded by the 'peace' movement as a great distortion of the real issues. Since its publication, the theme has been adopted on several occasions, most recently in Euan Lloyd's film *Who Dares Wins*, which envisaged the use of the CND by a terrorist group as cover for its operations. This provoked a similarly outraged reaction from the 'peace' movement. But are such scenarios all that unrealistic? As this book demonstrates, there is no shortage of sympathy within the CND and other unilateralist bodies for Soviet-backed regimes and organisations—not excluding those which resort to violence and terrorism in the name of 'liberation'.

When Fitzgibbon's "far-fetched" book appeared in 1960, few would have predicted that some 'peace' activists would be demonstrating *in support of* a country's right to have nuclear weapons on its soil less than three years later. Yet during the Cuban missile crisis that is precisely what happened. It was thus entirely in character that the Soviet deployment of SS-20 missiles was met with a deafening silence between 1977 and 1979, but that a massive revival of the CND occurred within weeks of Nato's December 1979 decision to install Cruise missiles in response.

This book is neither a novel nor a film script. It is a careful study of the current 'peace' movement, in particular the CND, which seeks to put it in its proper political and historical perspective. In doing so, it shows that the scenarios outlined by writers such as Fitzgibbon—far from being unrealistic—are well within the bounds of credibility.

Previous studies of the CND have either relied largely upon secondary sources or have been carried out by sympathisers of the 'peace' movement. Whilst books such as Christopher Driver's *The Disarmers*, Taylor and Pritchard's *The Protest Makers* and the CND's own *The CND Story* contain much interesting material, they are slanted to portray the CND in a favourable light. This book will offset that imbalance. However, in contrast to other critical commentaries, it relies as much as possible on primary sources, including confidential internal CND documents

Palestine Liberation Organization
London Office



منظمة التحرير الفلسطينية
مكتب لندن

Date:

التاريخ :

Ref:

المرجع :

Mgr Bruce Kent
Campaign for Nuclear Disarmament
11 Goodwin Street
London N.4.

26th April 1982

Dear Mgr Kent,

PALESTINE DAY NATIONAL RALLY IN LONDON

On Saturday, 15th May, a National Rally in support of the Palestinian people will be held in London. This year's rally to mark Palestine Day is particularly pertinent against the background of the increasing repression of our Palestinian people living under the illegal Israeli military occupation on the West Bank, Gaza Strip and in Arab Jerusalem. I am sure that you will agree that it is important that the maximum number of people support this rally, and express their rejection of Israel's actions against the Palestinians.

I am, therefore, officially inviting your organisation to support this rally, and to encourage your members and supporters to attend.

The Rally is being organised by the London Office of the Palestine Liberation Organisation:

Date: Saturday, 15th May 1982.

Assemble: Hyde Park (near Speakers' Corner) at 12.30pm.

March: From Speakers' Corner to Trafalgar Square.

Rally: Trafalgar Square, commencing 3.00pm.

If you have members wishing to attend from outside London, and should there be problems with transport, please contact my office and we will do our best to liaise with those groups arranging buses to London to assist you.

In advance, I would like to thank you for your support and co-operation.

Yours sincerely,

NABIL RAMLAWI,
London Representative,
The Palestine Liberation Organisation.

52 Green Street, London W1, England
Telephone: 01-491 8872

تلفون : ٦٢٩٠٠٤٤

CND terrorism support.

ALL 3.5.82.
B.K.
CND. BRUCE KENT'S
INITIALS, DATE
AND DISTRIBUTION TO "ALL"

250,000 CND marchers jam heart of London

THE largest CND demonstration in two decades brought traffic in central London to a standstill yesterday. It was the last major protest against cruise missiles before their arrival at Greenham Common, planned for later this year.

At a rally in Hyde Park Mr Neil Kinnock was barracked by a group of black-flag-waving anarchists. A photographer was led away bleeding from a head wound as sticks, bottles and beer cans were thrown at police.

There were jeers and chants of "Politicians are liars" as Mr Kinnock, who had stood up on the platform to loud cheers, told demonstrators "This is the living movement, this is the movement for life."

He went on, "We were told that this is the movement of weakness and appeasement but we're saying this is the movement of people with the strength to care, and of people with the sense to know that nuclear weapons are made by

human beings and must be dismantled by human beings."

About 250,000 demonstrators in two columns — one headed by Mr Michael Foot and the other by Mr Bruce Kent and Mrs Joan Ruddock, the CND leaders — congregated on the Victoria Embankment. Mr Kinnock's wife Glenys and their two children, Stephen, 13, and Rachael, 11, were among the marchers.

The Coalition for Peace through Security staged a banner-and-placard counter-demonstration from the roof of their offices in Whitehall. Mr Tryggvi McDonald, 23-year-old son of Senator Lawrence McDonald, the American politician who was killed when Soviet jets shot down a South Korean airliner, spoke through a loud hailer.

He asked: "If the Russians behaved in this way to dozens of innocent people in a defenceless aircraft, how do you think they would behave towards millions of people in a defenceless country?"

By CATHERINE STEVEN and CAROLE DAWSON

In Hyde Park, punks with coloured hairstyles watched entertainments as the marchers arrived. Roland Muldoon, the comedian, was joined on the stage by a police officer who warned him against his liberal use of four-letter words.

Scotland Yard said 25 arrests were made, mostly for minor offences.

Mrs Joan Ruddock, chairman of CND, announced plans for a new campaign. She said "Our aim is to ensure that the British people become aware of the immense threat posed by having the American-controlled weapons in this country."

More than 400 coaches, each carrying 50 demonstrators from the provinces, were booked into parking spaces at Hyde Park and 33 trains were chartered from British Rail. Each train cost nearly £5,000 to hire.

CND said its local groups had raised funds or collected fares from demonstrators.

OUR DIPLOMATIC STAFF writes: The "week of action" against cruise and Pershing II missiles

staged by the West German Peace Movement, the largest in Europe, reached a climax yesterday as hundreds of thousands of demonstrators rallied in Bonn, Hamburg, West Berlin, Stuttgart and at the American base at Neu-Ulm.

Demonstrators outnumbered the total population in Bonn where 30,000 formed a "human chain" linking embassies.

Tens of thousands of anti-nuclear demonstrators rallied in Paris and Rome.

CND opposed by 67 pc

Only 23 per cent of people questioned in a Gallup Poll thought Britain should give nuclear weapons unilaterally. Unilateralism was opposed by 67 per cent with 10 per cent "don't know".

Among Labour supporters, 54 per cent opposed unilateralism. The poll was conducted for the Coalition for Peace Through Security.

Editorial Comment—P.18



THE SUNDAY TIMES

The Labour leader, Mr Neil Kinnock, who was the star turn in Hyde Park yesterday, has had to tailor his views to suit public opinion. In his short political career he has so far discarded his earlier sympathy for a neutral Britain (the Guardian poll found only 8 per cent in favour of that, with 73 per cent pro-Nato) and suppressed his own strong instincts in favour of unilateral nuclear disarmament (the poll showed only 16 per cent want that). But he can still rant against Cruise because public opinion is more finely balanced and Labour, for once, reasonably united.

Mr Kinnock's sudden enthusiasm for conventional defence, however, is hardly convincing. This is a country which has far fewer combat aircraft today than it had in 1939. The build-up of expensive conventional forces needed to make a non-nuclear Britain secure would be enormous. Does anyone seriously expect a future Kinnock government to devote more money to defence than Mrs Thatcher? Or is the new morality of the left to hide safely under the American nuclear umbrella, eschewing anything to do with such nasty weapons themselves?

The case for Cruise is strong, and the imminent arrival of the missiles a matter of some relief. Their deployment marks the failure of a major Soviet effort to decouple western Europe from the United States. As long as there was a chance of the "peace" protesters thwarting deployment, the Kremlin was never likely to take arms control talks seriously. The Russians had already deployed their SS-20s and had no reason to negotiate away an imbalance of terror which suited them.

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- 2 **THE BRITISH 'PEACE' MOVEMENT, 1917–1964** 46
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The contribution of the CND to the size of Labour's defeat in June 1983 cannot be quantified precisely, but there can be no doubt of the extent to which it was decisive. "*The tragedy on June 9*", wrote Labour's Roy Hattersley in his unsuccessful bid for the Party's leadership the following month, "*was that too often we spoke for small but vocal groups who were no more representative of the typical Labour Party member than they were of the voters whose support we lost. . . . If we are to respect and trust the people, we must begin to listen to their opinions on the policy which lost us most votes at the last election—defence and disarmament. . . . [The] notion that we might give up our nuclear protection if others did not do the same was overwhelmingly rejected.*"³

Despite the Hattersley analysis of Labour's electoral disaster, it was to Neil Kinnock that the Party turned in the aftermath of defeat. In the run-up to the election, Kinnock had declared: "*I am a strong supporter of unilateral nuclear disarmament and at the CND national demonstration on October 22 I will be reaffirming Labour's commitment to unilateral nuclear disarmament.*"⁴

p. 3:

If the CND's most persistent asset was the superior activism of its supporters, serviced and directed by a full-time team of astute political organisers, its most impressive asset was its ability to mount and exploit massive demonstrations. Hitler's techniques of mass manipulation are now well known: (1) "All great movements are popular movements, volcanic eruptions of human passions and emotional sentiments, stirred either by the cruel Goddess of Distress or by the fire-brand of the world hurled among the masses . . ."; (2) "The art of leadership . . . consists in consolidating the attention of the people against a single adversary and taking care that nothing will split up that attention"; (3) "Only constant repetition will finally succeed in imprinting an idea on the memory of the crowd"; and (4) "The great masses of the people . . . will more easily fall victim to a great lie than to a small one."⁶ It is generally accepted, however, that he drew heavily on the work of Gustave Le Bon, whose *Psychologie der Massen* was one of the earliest authoritative studies of crowd psychology.

The similarities between the main features of crowd-manipulation identified by Le Bon (and used by Nazis and Communists alike) and the practices of the CND are striking:—

4 'Peace' of the Dead

1 To appeal to mass emotion rather than reason

Both the Communists and Nazis have consistently exploited the word 'peace' as a potent propaganda weapon. In November 1938 Hitler boasted to his press corps how only "by continuously declaring the German desire for peace" had he been able to give Germany the armaments which "time and time again [had] always been the essential precondition for any further move (see Chapter 1, page 27)."⁸

Pope Pius XI denounced the way in which Communists manipulate people through the use of mass movements and demonstrations, in his famous Encyclical letter of 1937 entitled *Atheistic Communism*:

The secret lies in a diabolically efficient system of propaganda, probably unparalleled in history. Directed from one centre, it is skilfully adapted to the special conditions of each country; having enormous funds at its disposal it makes use of numerous organisations, great international congresses and intensive campaigns. Newspapers, pamphlets, films, the theatre, the radio, schools, universities, all these are channels by which its influence is made gradually to reach men of every class and condition, even the higher classes; and their minds and hearts are the more fatally poisoned by its venom because they are probably quite unconscious of imbibing it.¹¹

... seeing that the world is anxious for peace, the leaders of communism now pose as the most ardent supporters of every movement for the establishment of international accord.¹²

Sabotage is commonplace, of which probably the worst case was when Greenham women secretly cut hydraulic pipes on construction equipment, thus endangering the lives of site-workers. After consulting the CND Executive Committee, Joan Ruddock refused to condemn such activity, and was instructed merely to express "surprise that anyone connected with the Campaign could be involved in anything that could reasonably be so interpreted."¹⁷ Nevertheless, in February 1985 Roger Westmoreland, the Secretary of Pocklington CND, was gaoled for three years and two of his branch members received shorter terms of imprisonment for causing over £228,000-worth of damage by "starting a fire at what they believed to be part of the Fylingdales nuclear early warning centre." In reality, what they attacked was a vital radio mast for the civil emergency services of North Yorkshire and Humberside: eight radio channels used by the fire services and the police were put out of action.¹⁸

Another CND device is to suggest that war will break out not because of the fundamental hostility felt by dictatorships for democracies but because the piling up of armaments will take on a momentum all of its own and somehow propel nations into wars not of their own choosing. In his 1981 Reith Lectures, Professor Laurence Martin addressed this question, and pointed to

Sir Edward Grey, the Liberal Foreign Secretary who led Britain into the First World War and who somewhat self-defensively wrote afterwards that ‘the enormous growth of armaments, in Europe, the sense of insecurity and fear caused by this — it was these that made war inevitable.’ I would be more inclined to look for causes at the decay of the Eastern European empires, but, be that as it may, there is certainly plenty of evidence that arms races do *not* necessarily lead to war, and the role frequently assigned to the democracies’ neglect of arms as a cause of the Second World War suggests the complexity of the issue . . . A recent careful, statistical study of the subject, published in the journal of the very anti-militaristic Center for Science and International Affairs at Harvard, concludes somewhat sheepishly but with admirable intellectual honesty that ‘according to our data . . . the presence of a nuclear arms race, far from constituting a given of international politics, proves to be a chimera. We have,’ they say, ‘tried again and again to test for the presence of arms competition or arms racing and we failed to find anything each time.’²⁰

In its 1983–4 edition of *The Military Balance* the International Institute for Strategic Studies similarly dismissed “the popular impression of a widespread arms race”.²¹ As for the CND’s stated preference for hotly denying comparisons of disarmament agitation now with that in the 1930s, but trying to draw alternative parallels with the pre-1914 situation, the comments of Professor Francis Beer on the earlier period are instructive. Whilst noting that there were indeed a number of arms races before the First World War, he shows that it does not follow that they precipitated the conflict or even made it more likely:

We see a steep rise in British and German naval expenditures between 1898 and 1905. We may ask ourselves why war did not occur here. Further, between 1905 and 1910 German naval construction rose very substantially. British naval building did not follow the German lead, but declined. After 1910 German naval building slowed appreciably, but British naval expenditures rose steeply again. Finally, German naval expenditure dropped sharply just before the outbreak of the war.²²

The role of 'peace' in Soviet strategy is as crucial to the Kremlin as it was to the expansionists of the Third Reich prior to the Second World War. Despite the failure of the recent 'Peace' offensive to prevent the deployment of Nato missiles in Europe, further battles can be expected whenever the open societies of the West have to implement strategic decisions to maintain a balance of security. For this reason, a detailed analysis of the propaganda techniques and organisational structures of the nuclear disarmament movement, though long overdue, will be of enduring relevance.

Notes and References

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- 2 *The Leveller*, No.40, June 1979.
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- 4 Reply to Labour CND questionnaire, quoted in *Tribune*, 28 October 1983.
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- 6 Adolf Hitler, *Mein Kampf*, Vol.1, Chapters 3, 3, 6 and 10, respectively.
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- 8 *Secret Address to Representatives of the German Press*, Munich, 10 November 1938, quoted in Z.A.B. Zeman, *Nazi Propaganda*, p.213.
- 9 Willi A. Boelcke (ed.) *The Secret Conferences of Dr Goebbels, October 1939-March 1943*, pp.68-9.
- 10 *Sanity*, February-March 1981.
- 11 Pope Pius XI, *Atheistic Communism*, § 2.26.
- 12 *Ibid.*, § 6.79.
- 13 *The Times*, 6 May 1983.
- 14 *The Guardian*, 5 November 1983.
- 15 Dan Smith, *Forward Planning: CND after the Election* (confidential memorandum), June 1983.
- 16 *Sanity*, July 1983.
- 17 *Minutes of the CND Executive Committee meeting*, 1 October 1983, part 3, para 4.
- 18 *The Guardian*, 5 February 1985.
- 19 *The Times*, 22 October 1983. Peter Cadogan was expelled from the Socialist Labour League (SLL)—now the Workers Revolutionary Party—in Autumn 1959 and, together with the remnants of the Trotskyist Nottingham Marxist Group (see Chapter 7) he formed the International Group, which in turn became the International Marxist Group and is now the Socialist League. He is still very active in the 'peace' movement.
- 20 *The Listener*, 12 November 1981.
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- 22 Francis Beer, *Peace Against War*, p.271.

1 THE SOVIET 'PEACE' OFFENSIVE, 1917-68

One must look back to the Russian Revolution of 1917 to put the 'Peace' Offensive into a proper historical perspective. Since that time, 'peace' has had a dominant place in Communist propaganda, along lines prescribed by Lenin. For nearly seventy years millions of innocent people have genuinely believed that they were working for *peace* whereas in reality they have been assisting the implementation of Soviet foreign policy.

Every Soviet action is done in the name of 'peace'. The Bolsheviks were fighting for 'peace'; the Nazi-Soviet Pact was to secure 'peace' for Europe; and the SS-20 missiles make the continent a more 'peaceful' place. In one sense this is true, however, for in Communist jargon 'peace' is synonymous with an unquestioning submission to Soviet foreign policy. So when Soviet leaders refer to Moscow's "desire for peace" they mean exactly that: world domination.

The advantages of stressing the word *peace* are obvious: it goes without saying that most ordinary people would prefer peace to war, with the inference that anyone against 'peace' is for war. But Lenin took care to avoid confusion between 'peace' and pacifism:

Disarmament is the ideal of socialism. There will be no wars in socialist society; consequently, disarmament will be achieved. But whoever expects that socialism will be achieved without a social revolution and the dictatorship of the proletariat is not a socialist. Dictatorship is state power based directly on violence. And in the Twentieth Century — as in the age of civilisation generally — violence means neither a fist nor a club, but troops. To put 'disarmament' in the [Socialist] programme is tantamount to making the general declaration: "We are opposed to the use of arms." There is as little Marxism in this as there would be if we were to say: "We are opposed to violence."¹

In the summer of 1931 the German Communist Party allied itself with the Nazis to oppose the Social Democrats, who had "accepted the slavery and humiliation of the Versailles Peace."²⁴ Even after Hitler had come to power and the Communist Party was being systematically eliminated, Stalin continued to urge support for the Nazis. Writing in the Comintern's in-house journal *Rundschau* in 1933, he urged German Communists to remain steadfast:

*The momentary calm after the victory of fascism is only a passing phenomenon. The rise of the revolutionary tide will inevitably increase. The open dictatorship of fascism destroys all democratic illusions, frees the masses from the influence of the social democrats, and thus accelerates the speed of Germany's march towards the proletarian revolution.*²⁵

There were other prominent Communists apart from Neumann who appreciated the dangers of Fascism, including Georgi Dimitrov, the Head of the European section of the Comintern from 1929 to 1935 and the Secretary-General of the organisation thereafter. But Stalin's view of Fascism was not based on ideology nor upon a hatred of Nazism; it was dictated, rather, by foreign-policy considerations. Not only was Stalin interested in safeguarding the Soviet Union, he was also keen to make any foreign policy gains that he could. If Hitler had been more amiable towards Stalin, and if he had not had a deep-rooted hatred of the Russians and the conglomerate of different races that they represented, then the course of history would undoubtedly have been different. Stalin's main concern was that Hitler might form an alliance with Britain and France to destroy Communism. There were certainly a number of Right-wing politicians in the United Kingdom who viewed such a move as desirable. Lord Halifax, for instance, visited Hitler in November 1937 and congratulated him upon having "prevented the expansion of Communism to the West by stopping it in his own country."²⁶

Stalin's approach to the question of with whom he should work was not based on the relative evils of Capitalism or Fascism. It was based on the logic of Leninism. Speaking to the Central Committee in January 1925 he said: "Should . . . a war begin . . . we will have to take part, but we will be the last to take part so that we may throw the decisive weight onto the scales."²⁷

The change from a policy of co-operation with the Nazis to one of outright opposition was a gradual one. In fact, a number of Communists had been engaged in anti-Fascist activities for at least three years

before the U-turn took place. The change was explained to the assembled representatives of the European Communist parties at the Seventh Congress of the Comintern held in Moscow in August 1935. During the Congress it was 'decided' that the way to oppose Fascism was through a revival of united front-type tactics. Communists would form 'popular fronts'—a term devised by the French Communist Party in 1934, a year before the Congress—in alliance with other Left-wing and Social Democratic groups who wanted to oppose Fascism. The Nazis had easily triumphed over a divided and dismantled Left in Germany which had outnumbered them before they took power. If a popular front had been formed, the surviving German Communists argued, with both the bourgeois and Marxist Left working together, then Hitler might have been beaten. As it was, the intransigence of the Communists, coupled with their enthusiasm for the way Hitler had disposed of the Social Democrats, had made victory easy for the Nazis.

The Seventh Congress decided that Communists must use their old rallying call of 'Fighting for Peace' to oppose the threat of Fascism or, as far as Stalin was concerned, to neutralise the danger posed to the Soviet Union by Germany. Dimitrov outlined the mission of Communists:

*We must penetrate among the pacifist masses and carry out the work of enlightenment among them, using forms of organization and action which are adapted to the level of consciousness of these masses and which give them the possibility of taking the first step in the effective struggle against war and capitalism. We must take two things into account. The first is that the organization of the pacifist masses cannot and must not be a Communist organization; the second is that in working in this organization Communists must never give up explaining with the greatest possible patience and insistence their own point of view on all the problems of the struggle against war. [My emphasis]*²⁸

Dimitrov used an interesting historical example to illustrate to supporters of the Comintern the type of political tactics he was advocating:

Comrades you will remember the ancient tale of the capture of Troy . . . The attacking army was unable to achieve victory until, with the aid of the famous Trojan horse, it managed to penetrate to the very heart of the enemy camp.²⁹

"NOW UP AT OUR WORKS..."



CARELESS TALK COSTS LIVES

"SHE SAILS AT MIDNIGHT..."



mean telling



THE ENEMY



CARELESS TALK COSTS LIVES



CARELESS TALK COSTS LIVES

SECURITY PRECAUTIONS FAILED WHEN SPIES INFILTRATED THE BRITISH CIVIL SERVICE

In a secret speech to German press representatives in Munich on 10 November 1938, for example, Hitler freely conceded that:

The prevailing circumstances have obliged me to speak, for a decade or more, of almost nothing but peace. Only, in fact, by continuously declaring the German desire for peace and Germany's peaceful intentions was I able, step by step, to secure freedom for the German people and to provide Germany with the armaments which have, time and time again, always been the essential precondition for any further move.³⁵

On 25 August 1948, under the aegis of the Cominform, the World Congress of Intellectuals for Peace opened in Wroclaw, Poland.

was the historian, A.J.P. Taylor, who attacked the conference for its virulently anti-Western stance. As he said: "This has been a congress preaching war, and not a congress preaching peace."⁴⁵

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Its third meeting was at the Stockholm World Peace Conference, a large gathering which took place in March 1950. It was similar in format to the Paris meeting but went further than praising the Soviets and denouncing American foreign policy. It launched the Stockholm Peace Appeal.

The ensuing Communist 'peace' campaign was intense and was widely condemned throughout the world. In Sweden concern was expressed about the use of Stockholm in Soviet propaganda, notably by the Prime Minister, Tage Erlander, on 16 July 1950 when he said:

It is with feelings of disgust that we in Sweden witness the brandishing of the name of our capital city in international Communist propaganda.⁵²

In October 1950 Donald McLachlan (later to become editor of the *Sunday Telegraph*) gave a lecture on the way in which the Soviet 'peace' offensive was developing. Commenting on the Stockholm appeal, he noted:

It is fair to point out that the advocacy of this appeal has been conducted with the greatest bitterness, with some vile abuse, and a great deal of pure hate propaganda. I cannot see any substantial difference in language and technique between much of the peace campaign propaganda and much of Goebbels's propaganda. The terms of the appeal must be judged with this fact in mind. Those who refuse to sign it are just branded as war-mongers . . . ⁵⁵

The Permanent Committee met in London in June and in Prague in August 1950 to lay plans for a major 'peace' conference which was scheduled for London in November 1950.

200 applicants were refused, including 84 from the Soviet Union, and in an address to the Foreign Press Association the Prime Minister, Clement Attlee, defended his decision:

It is a common device of disturbers of the peace to profess peaceful sentiments and to proclaim loudly that they themselves are in danger of attack. Hitler and Goebbels were adept at this. It is not, therefore, surprising to find that adherents of the Cominform whose activities are causing bloodshed and disturbance all over the world should proclaim themselves peace makers, should promote peace petitions, and should call a bogus peace conference.

Of course, the Communists say that this conference is not organized by them. Communist activities generally are camouflaged — in this country they can usually get a few respectable but misguided people to provide the sheep's clothing — but a denial by a Communist does not carry much weight. It is part of their doctrine that lying is perfectly legitimate to further their cause.

It is worth looking at the organization of this Congress. Its chairman is a Mr J.G. Crowther. If not a Communist, he is a very good example of a fellow-traveller.⁵⁸

Notes and References

- 1 V.I. Lenin, *Collected Works*, Vol.23, p.59.
- 24 Quoted in Ronald Segal, *The Tragedy of Leon Trotsky*, p.339.
- 25 *Rundschau*, 1 April 1933.
- 26 *Akten Zur Deutschen Auswartigen Politik 1918-1945*, p.47.
- 27 Address to the Central Committee plenum, 19 January 1925.
- 28 Speech by Dimitrov to Seventh Congress, 2 August 1935, quoted in P. Selznick, *The Organizational Weapon: A Study of Bolshevik Strategy and Tactics*, pp.146-7.
- 29 G. Dimitrov, *The Working Class against Fascism*, quoted in J.W.D. Trythall, *Franco: A Biography*, p.79.
- 30 *The Times*, 3 March 1934.
- 31 *Ibid.*, 2 April 1934.
- 32 *Ibid.*, 3 April 1934.
- 33 V. Molotov, *Soviet Peace Policy: Four Speeches by V. Molotov*, pp.28-32.
- 34 Jane Degras (ed.), *Soviet Documents on Foreign Policy*, Vol.III, pp.379-80, 406.
- 35 Quoted in Z.A.B. Zeman, *Nazi Propaganda*, p.213.
- 45 *The Times*, 27 August 1948.
- 46 *Ibid.*, 28 August 1948.

- 47 *Ibid.*, 15 September 1948.
 52 *The Times*, 17 July 1950.
 53 *Ibid.*, 8 August 1950.
 54 (Source: *Soviet News*, 22 March 1950.)

Veteran London Communist C.H. 'Bob' Darke admitted in 1952, however, that many signatures 'collected' in Britain were in fact forgeries. "In the early days of the Petition it was easy enough to obtain signatures, but later on, as the non-Communist press began to hit at it, things became less easy. It was then, I think, that the rank-and-file Communists began to forge signatures." (Bob Darke, *The Communist Technique in Britain*, p.149)

- 55 *International Affairs*, January 1951, pp.12 and 17.
 58 *The Times*, 2 November 1950.

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Pankhurst had no inhibitions about her real politics, and proudly declared to all who would listen that she would "call [herself] a Bolshevik."⁸ As such, she presently attended one of the Comintern's Congresses, only to be gaoled for six months in Holloway Prison on her return to Britain, under the Defence of the Realm Act. There she spent the first half of 1921 reading Marx's *Das Kapital*.⁹

Sylvia Pankhurst's activities in Britain did not escape the attention of Lenin, who mentioned her on a number of occasions in his writings. Yet she was too enthusiastic for Lenin, who appreciated the dangers for Communists if they were too outspoken in their aims. In his *'Left-Wing' Communism — an Infantile Disorder* she was singled out:

There is no Communist Party in Britain as yet, but there is a fresh, broad, powerful and rapidly growing communist movement among the workers, which justifies the best hopes . . . In its issue of February 21, 1920 . . .

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The Workers' Dreadnought, weekly organ of the [Workers' Socialist Federation], carried an article by the editor, Comrade Sylvia Pankhurst, entitled "Towards a Communist Party". The article outlines the progress of the negotiations between . . . [the British Socialist Party, the Socialist Federation, the South Wales Socialist Society and the WSF], for the formation of a united Communist Party, on the basis of affiliation to the Third International, the recognition of the Soviet system instead of parliamentarianism, and the recognition of the dictatorship of the proletariat.¹⁰

Lenin then went on to explain the differences that existed between the groups, particularly regarding affiliation to the Labour Party. He attacked Comrade Pankhurst for thinking that support for the Labour Party "is a betrayal of communism".¹¹ It was important to exploit parliamentary systems, he argued, as he had done in Russia: "The masses in Russia are no doubt no better educated than the masses in Britain; if anything they are less so".¹²

Appeasement and the Second World War

Immediately after the First World War widespread pacifist activity was largely unknown. The situation changed in the 1930s. In 1936 Canon 'Dick' Sheppard¹⁷ formed the Peace Pledge Union (PPU). Before that time a number of smaller groups had been active, including the League of Nations Union (LNU), the Society of Friends (Quakers), the Fellowship of Reconciliation and the No More War Movement (a Socialist organisation, successor to the N-CF). There had also taken place the remarkable East Fulham by-election of 25 October 1933, when a Government majority of 14,500 was overturned on what Churchill was later to describe as "a wave of pacifist emotion". Despite Hitler's accession to the Chancellorship of Germany, the successful Labour candidate, John Wilmot, had demanded that Great Britain should "give a lead to the whole world by initiating immediately a policy of general disarmament".¹⁸ (Ironically, a world war and fifty million deaths later, Wilmot—as Attlee's Minister of Supply—was to be one of the six members of the 'GEN 163' Committee, which took the secret decision in January 1947 to construct the British atomic bomb.)

By November 1936, when rearmament had become more of a political possibility, the Prime Minister Stanley Baldwin was able to admit to the House of Commons how decisively "that [pacifist] feeling that was given expression to in Fulham" had deterred him from pressing publicly for strengthened defences.¹⁹

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During the 1930s when popular fronts were being run by Communists to oppose Fascism across Europe, J.R. Campbell, Editor of the CPGB's *Daily Worker*, described the possibility of a Nazi-Soviet Pact as a "vile slander", yet when the Pact was announced it was hailed as a "master stroke of Soviet peace policy" and "a victory for peace and socialism against the war of fascism and the pro-fascist policy of Chamberlain."²⁵ In August 1939 the *Daily Worker* had declared that: "Now is the time and the hour to develop the mass movement for the immediate signing of the Anglo-Soviet Pact" against the Nazis.²⁶ Yet only two months later, after the Nazi-Soviet Pact had paved the way for the outbreak of war, the *Daily Worker* claimed that Britain was now concerned "not to rescue Europe from Fascism, but to impose British imperialist peace upon Germany" before fomenting war against the Soviet Union.²⁷



Prime Minister Chamberlain and Hitler, September 22, 1938, Bad Godesberg



The Munich agreement signed by Hitler, waved and cheered
(Prime Minister Neville Chamberlain at Heston Airport, 1938)





September 30, 1938 peace promise:

We, the German Führer and Chancellor and the British Prime Minister, have had a further meeting today and are agreed in recognising that the question of Anglo-German relations is of the first importance for the two countries and for Europe.

We regard the agreement signed last night and the Anglo-German Naval Agreement as symbolic of the desire of our two peoples never to go to war with one another again.

We are resolved that the method of consultation shall be the method adopted to deal with any other questions that may concern our two countries, and we are determined to continue our efforts to remove possible sources of difference and thus to contribute to assure the peace of Europe.

Handwritten initials: H. H.

Neville Chamberlain

September 30, 1938.



Prime Minister Chamberlain's Foreign Office ordered British football team to give Nazi salute in 1938 Third Reich, for appeasement.

WANTED!

**FOR MURDER . . . FOR KIDNAPPING . . .
FOR THEFT AND FOR ARSON**



Can be recognised full face by habitual scout. Rarely smiles. Talks rapidly, and when angered screams like a child.

ADOLF HITLER ALIAS

Adolf Schicklegruber,
Adolf Hittler or Hidler

Last heard of in Berlin, September 3, 1939. Aged fifty, height 5ft. 8½in., dark hair, frequently brushes one lock over left forehead. Blue eyes. Sallow complexion, stout build, weighs about 11st. 3lb. Suffering from acute monomania, with periodic fits of melancholia. Frequently bursts into tears when crossed. Harsh, guttural voice, and has a habit of raising right hand to shoulder level. **DANGEROUS!**



Profile from a recent photograph. Black moustache. Jowl inclines to fatness. Wide nostrils. Deep-set, menacing eyes.

FOR MURDER

Wanted for the murder of over a thousand of his fellow countrymen on the night of the Blood Bath, June 30, 1934. Wanted for the murder of countless political opponents in concentration camps.

He is indicted for the murder of Jews, Germans, Austrians, Czechs, Spaniards and Poles. He is now urgently wanted for homicide against citizens of the British Empire.

Hitler is a gunman who shoots to kill. He acts first and talks afterwards.

No appeals to sentiment can move him. This gangster, surrounded by armed hoodlums, is a natural killer. The reward for his apprehension, dead or alive, is the peace of mankind.

FOR KIDNAPPING

Wanted for the kidnapping of Dr. Kurt Schuschnigg, late Chancellor of Austria. Wanted for the kidnapping of Pastor Niemöller, a heroic martyr who was not afraid to put God before Hitler. Wanted for the attempted kidnapping of Dr. Benes, late President of Czechoslovakia. The kidnapping tendencies of this established criminal are marked and violent. The symptoms before an attempt are threats, blackmail and ultimatums. He offers his victims the alternatives of complete surrender or timeless incarceration in the horrors of concentration camps.

FOR THEFT

Wanted for the larceny of eighty millions of Czech gold in March, 1939. Wanted for the armed robbery of material resources of the Czech State. Wanted for the stealing of Memelland. Wanted for robbing mankind of peace, of humanity, and for the attempted assault on civilisation itself. This dangerous lunatic masks his raids by spurious appeals to honour, to patriotism and to duty. At the moment when his protestations of peace and friendship are at their most vehement, he is most likely to commit his smash and grab.

His tactics are known and easily recognised. But Europe has already been wrecked and plundered by the depredations of this armed thug who smashes in without scruple.

FOR ARSON

Wanted as the incendiary who started the Reichstag fire on the night of February 27, 1933. This crime was the key point, and the starting signal for a series of outrages and brutalities that are unsurpassed in the records of criminal degenerates. As a direct and immediate result of this calculated act of arson, an innocent dupe, Van der Lubbe, was murdered in cold blood. But as an indirect outcome of this carefully-planned offence, Europe itself is ablaze. The fires that this man has kindled cannot be extinguished until he himself is apprehended—dead or alive!

THIS RECKLESS CRIMINAL IS WANTED—DEAD OR ALIVE!

Post-war activity

The 'peace' movement was not to re-emerge until well after the war was over. In the late 1940s the impact of nuclear weapons was not fully appreciated by the public at large—at least, not in terms of a threat to peace. A trade union official, Bob Edwards (later a long-serving Labour MP), had warned of the possible military uses of atomic fission early in 1943; but after Hiroshima and Nagasaki were bombed opinion polls showed that only 21 per cent of people in Britain disagreed with the way in which the Allies had stopped the war in the Far East.³⁵

The first of these events was the announcement by the United States that, as a result of the continued arms build-up and confrontational policies of the Soviet Union, America was going ahead with the manufacture of the H-bomb. This resulted in political moves being made in Britain to try to prevent the Government from following a

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similar course. Hiroshima Day was commemorated for the first time in Britain in August 1950. Ostensibly this was to remember the victims of the bombing. In reality, it was for purely political reasons. The PPU's contribution was to publish a book by Dr Alex Comfort attacking civil defence, entitled *Civil Defence: What you should do now*.

The second development was a speech by Professor E.S. Shire, a reader in Nuclear Physics at Cambridge, in which he explained, for the first time to the general public, how the testing of atomic weapons in the atmosphere might lead to the formation of radioactive isotopes which could enter and fatally contaminate the human body.³⁷ Henceforth, people began increasingly to doubt whether nuclear energy really was an unalloyed blessing.

[Dr Alex Comfort wrote love-not-war sex books]

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1958;

The first Aldermaston march attracted only 4,000 protestors. They reached their destination on 7 April. It was intended to be a non-violent protest, but the organisers had not bargained for a counter-demonstration warning that unilateralism would bring to Britain the repression witnessed in Budapest less than two years earlier. The counter-protest, by the indefatigable Norris McWhirter and others, ended when their car was attacked and damaged by marchers, who also seized and destroyed their banners. This markedly un-peaceful behaviour was widely reported to the detriment of the demonstrators.⁷⁰ The political inclinations of the marchers were reflected by the speakers at the rally, who included Stephen Swinger, MP, Chairman of VFS, and Philip Toynbee, a journalist and former CPGB activist, who spoke about the need to disarm the West. Commenting on the march, *The Times* noted that:

The leaders on the platform and the rank-and-file on the march, for instance, unmistakably suggested that the differences of view contained within the campaign are the differences found on the left of politics.⁷¹

The activities of the Communist Party did not go unnoticed. In April 1961 the anarchist journal *Freedom* pointed out that during "this year . . . infiltration of the CND by Communists and fellow-travellers was most noticeable" and argued that there was a good "case for excluding the Communist Party from the CND." The reason was because "many sincere radicals who would be prepared to work with people of many different political and religious affiliations on determined issues, would be unwilling to do so if it also meant joining with members of the Communist Party."⁹³ By May 1961 there were at least 20 Communist Party members (not including fellow-travellers) on the CND's 52-strong National Committee, and *Freedom* complained that the Communist Party was "now putting its heart and soul into the Collins-Foot unilateral enterprise."⁹⁴

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The incident which probably most damaged the movement, and which has now grown into something of a legend, was the so-called 'Spies for Peace' affair.¹¹⁹ The 'Spies for Peace' group was formed as a sub-committee of the London Committee of 100. It collected information about the Government's Regional Seats of Government (RSGs) in the event of war or civil emergency, and printed leaflets giving details about RSG 6 which was close to the route of the 1963 Aldermaston march. Copies were sent to the national press and to politicians on 11 April 1963.

The publication of these leaflets was universally condemned. *Tribune* said that "the notorious 'Spies for Peace' pamphlet . . . had done the nuclear disarmament movement a great deal of harm."¹²⁰ Canon Collins explained: "Of course everyone understands that the government has to make preparations such as this,"¹²¹ whilst James Cameron commented: "God save us from our friends."¹²²

There was strong pressure on the government that those responsible should be tracked down and imprisoned for treason. Special Branch set about the task of identifying the culprits. Nobody was prosecuted and, within the 'peace' movement, a myth grew up that it was the absolute secrecy of the group which prevented the combined resources of the State from prosecuting. Thus Dennis Gould, who was active in the

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Committee of 100 at the time, now explains that: "The Spies for Peace were efficient and never discovered."¹²³ In reality, it was an open secret within the Committee of 100 that such people as Laurens Otter and Bill Christopher were involved, and it did not take Special Branch long to identify those responsible. As Otter later explained:

. . . It was clear that MI5 knew we had produced it, and knowing, didn't want to prosecute. Someone had realised that prosecuting would have given more publicity, and would have been inexpedient.¹²⁴

Notes and References

- 1 Martin Ceadel, *Pacifism in Britain, 1914-45*, p.33. See also Peter Stansky, *The Left and War: The British Labour Party and World War I*.
- 2 David Mitchell, *The Fighting Pankhursts: A Study in Tenacity*, p.56.
- 3 *Ibid.*, p.54. Sylvia Pankhurst was Mrs Emmeline Pankhurst's daughter.
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- 4 *Ibid.*, p.81.
- 5 *The Times*, 1 January 1917.
- 6 Richard Pankhurst, *Sylvia Pankhurst: Artist and Crusader*, p.180.
- 7 Mitchell, p.82.
- 8 *Ibid.*, p.83.
- 9 Pankhurst, p.181.
- 10 V.I. Lenin, 'Left-Wing' Communism, an Infantile Disorder, p.62.
- 11 *Ibid.*, p.77.
- 12 *Ibid.*, p.73.
- 17 Canon H.R.L. 'Dick' Sheppard (1880-1937) became a pacifist in 1927, "when his main inspiration seems to have been the need to find an issue which could revitalise the Church of England." (Ceadel, p.59)
- 18 Winston S. Churchill, *The Second World War: Vol.I, The Gathering Storm*, p.100.
- 19 *Ibid.*, pp.194-5.
- 20 David C. Lukowitz, "British Pacifists and Appeasement: the Peace Pledge Union", *Journal of Contemporary History*, Vol.9, No.1, pp.115-27.
- 21 *Peace News*, 7 April 1939.
- 22 Ceadel, p.295. See also Robert Skidelsky, *Oswald Mosley*, pp.439-41.
- 23 Ceadel, p.294.
- 24 Bill Jones, *The Russia Complex—The British Labour Party and the Soviet Union*, p.24.
- 25 *Daily Worker*, quoted in Jones, p.38.
- 26 *Daily Worker*, 23 August 1939.
- 27 *Ibid.*, 5 October 1939.
- 35 John Minnion and Phil Bolsover, *The CND Story*, p.11.
- 37 See *The Times*, 9 August 1950.
- 70 *The Times*, 8 April 1958.
- 71 *Ibid.*, 5 April 1958.
- 93 *Freedom*, 8 April 1961.
- 94 *Ibid.*, 3 May 1961.
- 119 See *Anarchy*, No.29, July 1963.
- 120 *Tribune*, 19 April 1963.
- 121 *Peace News*, 19 April 1963.
- 122 *Daily Herald*, 17 April 1963.
- 123 *Peace News Pamphlet* No.2, p.32.
- 124 Laurens Otter, letter to author, 24 November 1983.

3 THE INTERREGNUM AND THE 'NEUTRON BOMB' 1964–80

Within six months of the Soviet invasion of neutral Afghanistan, the 'peace' movement was well under way, just as *détente* had promptly followed the 1968 Soviet invasion of Czechoslovakia. As in the 1930s, the clearest statements of totalitarian intent were never faced squarely—nor at all. Lenin had always held that real peace between Capitalism and Communism was inconceivable, at least in the long-term:

As long as Capitalism and Socialism exist, we cannot live in peace: in the end, one or the other will triumph—a funeral dirge will be sung over the Soviet republic or over world Capitalism!¹

The Soviet Union's leading theoretician, the late Mikhail Suslov, reaffirmed this with the onset of *détente* when he noted that in the era of 'peaceful co-existence' there would be no let-up in the struggle between the two systems "in the spheres of ideology, politics and economics".² *Pravda* similarly declared in 1973 that the conflict would continue until "*the complete and final victory of Communism on a*

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world-wide scale";³ and Boris Ponomarev of the Central Committee's International Department, attacking Western critics of Soviet-style *détente* three years later, still failed to refute their basic objections. To say that the Soviet Union, he wrote,

is using *détente* as a means of 'communist expansion' is . . . blackmail . . . intended to force the Soviet Union and other socialist countries into renouncing the class principles of their ideology and policy in the name of *détente* . . . There is no abolishing the objective laws of history, the developmental laws of human society.⁴

Again, as recently as 1983, Ivan Kapitonov, Secretary of the Central Committee of the CPSU, made the point that:

When the building of the then first and only socialist state—the USSR—was started, Lenin emphasised that the Communists' international duty was to do all they could in their own country to awaken, support and develop the revolution in all the other countries. In our day, this precept of Lenin's is embodied in the two-fold international task which the CPSU has been constantly fulfilling. The substance of it is to do even more in advancing the Soviet society, thereby exerting an influence on the balance of world forces and the course of world development, and to render effective support to the revolutionary, progressive movements of our day . . .⁵

If one considers five such agreements reached during the period of '*détente*' this pattern becomes very clear:

- (1) **SALT I TREATY.** This guaranteed the Soviet Union its 'throw-weight' superiority while allowing it to develop a MIRV capability. It also undermined European faith in the viability of the US nuclear deterrent.
- (2) **SALT II TREATY.** This gave the Soviet Union an even greater advantage in the strategic nuclear field than it enjoyed under the provisions of SALT I.
- (3) **HELSINKI FINAL ACT 1975.** In return for some vague and, in the event, dishonoured commitments to the recognition of basic human rights, the Soviet Union gained political concessions, trading links and, in particular, greater access to Western technology.
- (4) **TREATIES BETWEEN WEST GERMANY, EAST GERMANY AND THE SOVIET UNION.** In return for numerous political benefits, the Soviet Union generously conceded a written undertaking to permit traffic to pass between West Germany and West Berlin.
- (5) **UNDERGROUND NUCLEAR TEST TREATY.** This enabled the Soviet Union to complete its testing of larger nuclear warheads before it came into effect.

One reason for the eventual failure of '*détente*', from the Soviet point of view, was that it failed to mask the expansionist nature of the Soviet Union and its determination to undermine the West. The blame for this must lie with the Kremlin for, whilst the West was making concessions, Soviet 'advisers' were active in the most unstable areas of the world, the Soviet armed forces were being built up and in the Soviet bloc the repression of dissidents was becoming increasingly harsh. Nevertheless, '*détente*', while it lasted, enabled the Soviet Union to commit such transgressions without precipitating an international crisis.

Accompanying the transition from open hostility to 'peaceful co-existence' was a redefinition of the Soviet Union's revolutionary ambitions. Under the direction of Suslov and Ponomarev, the concept of the 'world revolutionary process' was developed,¹⁰ and on the occasion of the celebration of the 40th anniversary of the 7th Comintern Congress (see Chapter 1) Ponomarev and Suslov announced the transition of the Soviet policy of '*détente*' into a new revolutionary phase.¹¹

The role of ideology in Soviet foreign policy is significant, because it provides the sole source of legitimacy for the regime and offers a cover under which expansionist policies can be pursued.

The Soviet Union devoted considerable resources to its campaign against the ERW for two main reasons. First, it was a perfect opportunity to exploit tensions between the United States and its allies in Europe; second, the ERW was a very important weapon for Nato with its ability to kill Soviet tank crews without devastating the surrounding countryside as severely as battlefield nuclear weapons would do. To prevent its deployment would thus secure the continued effectiveness of the Warsaw Pact's huge numerical superiority in front-line conventional forces. The question of deployment had been discussed within Nato since 1973, and it was finally endorsed in the mid-1970s on the grounds of its military value and the fact that it would raise the 'nuclear threshold'

The Interregnum and the 'Neutron Bomb' 1964–80 95

1977:

The 'neutron bomb' was the single most important issue covered in the period from 25 July to 14 August. This encompassed the Soviet-inspired 'Week of Action' against the 'neutron bomb' from 6 to 13 August, which was organised by the World Peace Council. According to the WPC:

In 1977, the World Peace Council launched one of the biggest campaigns ever against a specific weapon—the neutron bomb.²⁷

96 *'Peace' of the Dead*

TASS reported during the campaign that: "Soviet Baptist leaders today condemned production of the neutron bomb as 'contrary to the teachings of Christ' and urged fellow Baptists in the United States to raise their voices in defence of peace."²⁹ Jimmy Carter was, of course, a devoted Baptist, and this initiative had the effect of 'peace' protesters in the United States taking the hint and disrupting services at his church, the First Baptist Church, in Washington, on three separate occasions.

The first phase started on 9 July with an appeal from TASS to President Carter, asking: "How can one pose as a champion of human rights and at the same time brandish the neutron bomb, which threatens the lives of millions of people?"³¹ The propaganda campaign was then intensified and the WPC began its 'Week of Action'.

The second phase started in January 1978 after Leonid Brezhnev wrote to all Western heads of government warning that the deployment of the ERW would "pose a grave threat to *détente*."

ON 7 APRIL 1978, CARTER GAVE IN AND DELAYED NEUTRON BOMB.

The CND and the 'neutron bomb'

In Britain, the campaign against the 'neutron bomb' was conducted by the CND, and marked an upsurge in 'peace' activism which was later followed by the anti-Cruise campaign of the 1980s. The anti-ERW campaign followed the standard pattern of marches, conferences, petitions and letters to newspapers. The CND also published a book entitled *The Neutron Bomb*, which presented its case against the ERW. [Chapter 1 of *The Neutron Bomb* was by CND's Cathy Ashton.]

The Neutron Bomb was written by Professor Eric Burhop, a former Vice-President of the World Peace Council, Treasurer of the J.D. Bernal

100 *'Peace' of the Dead*

Peace Library (see Chapter 6), and a life-long apologist for the Soviet Union and Communism. The evidence that Burhop produced to support his case against the ERW was not from conventional sources such as the Pentagon, nor even from the Left-leaning Stockholm International Peace Research Institute. According to the book, it came from Eastern Europe:

I [Burhop] am deeply indebted to several colleagues who have helped me in arriving at a clear understanding of the probable mode of action of the neutron bomb, particularly to Professor K.F. Alexander, Head of the Nuclear Physics department of the GDR, who presented a very illuminating paper "Zur Physik der Neutronenbombe" at a meeting of the Standing Committee on Disarmament of the World Federation of Scientific Workers held in [East] Berlin in September 1977.⁴¹

The Interregnum and the 'Neutron Bomb' 1964-80 101

In August 1980 President Reagan had announced that production of the ERW was going ahead after all, and this led to a renewed interest in the 'neutron bomb' by the 'peace' movement. Shortly afterwards, Lord Noel-Baker was interviewed by the Soviet newspaper *Izvestiya*. He described the ERW as "the most evil and the most ruthless weapon" in the world, and declared that the production decision reflected "the madness of US generals . . . who were obsessed with the illusory hope of winning a nuclear war." He went on to praise Brezhnev's 'peace' initiatives and attacked those of President Reagan.⁴⁹ A new propaganda campaign was launched on 5 February 1981.

- (1) Romesh Chandra, President of the World Peace Council, declared February a "month of action against the neutron bomb";
- (2) *Pravda* published an article warning West Europeans of the dangers which the 'neutron bomb' presented to them;
- (3) The *Morning Star* called for a "new and second campaign against this most horrible of weapons."⁵⁰
- (4) The Labour Party issued a statement announcing that it would campaign "in co-operation with fellow-socialists throughout Europe, to ensure that this foul weapon is rejected."

Notes and References

- 1 V.I. Lenin, *Collected Works*, Volume 31, p.430.
- 2 *Pravda*, 15 December 1972.
- 3 *Ibid.*, 22 August 1973.
- 4 *World Marxist Review*, May 1976.
- 5 Ivan Kapitonov, "A Working Class Party, the Whole People's Party", in *World Marxist Review*, July 1983.
- 10 Ponomarev first expounded the concept in *Kommunist* (October 1971) in an article entitled "Theoretical Problems in the Theory of the World Revolutionary Process". It was further developed in "The World Situation and the Revolutionary Process", in *World Marxist Review* (June 1974). It took Ponomarev and Suslov about five years of subtle campaigning for their ideas to be accepted. This was carried out in a series of articles in official papers and journals, until Brezhnev accepted the proposed transition to a new 'revolutionary offensive'. It was at the 1979 CPSU Congress that the Soviet leaders recognised in public the continuous "advance of the world revolutionary process" and emphasised that "the relaxation of tension by no means abolishes the laws of the class struggle." (See: Bundesinstitut für Ostwissenschaftliche und Internationale Studien, *The Soviet Union 1975-76*, p.181.)
- 11 *Kommunist*, No.11, 1975.
- 27 World Peace Council, *The World Peace Council*, p.20.
- 28 *The CIA and the Media*, pp.554-5.
- 29 Quoted by John Barron, "The KGB's Magical War for 'Peace'," *Reader's Digest (US edition)*, October 1982, p.226.
- 30 Department of State, *Forgery, Disinformation, Political Operations*, p.3.
- 31 Quoted in *Reader's Digest (US edition)*, October 1982, p.225.
- 41 Eric Burhop, *The Neutron Bomb*, p.5. The World Federation of Scientific Workers (WFSW) is a well-known Soviet International front organisation, formerly proscribed by the Labour Party. According to US Intelligence "throughout its history, the WFSW has neglected the pursuit of scientific objectives and has concentrated on supporting the Soviet line regarding disarmament and world political issues" (*The CIA and the Media*, p.623).

By exploding it at a height of about 500m above the ground, the blast wave when it reaches the ground is not strong enough to destroy strongly constructed buildings. On the other hand, the neutrons are extremely lethal.

- 42 *Marxism Today*, April 1981.
- 43 *Campaign!*, August/September 1981.
- 44 *Sanity*, April/May 1980.
- 45 In December 1983 during the CND Conference, Miss Ashton, having just completed a year as a CND Vice-Chairman, chaired a fringe meeting organised by *Marxism Today*, the theoretical journal of the CPGB.
- 49 TASS, 9 September 1981. | CPGB = Commie Party G-B.
- 50 *Morning Star*, 5 February 1981.

4 THE REVIVED SOVIET 'PEACE' OFFENSIVE, 1980–84

In December 1979 Nato decided to modernise its intermediate-range nuclear forces (INF), primarily in response to the deployment from 1977 onwards of Soviet SS-20s targeted on Western Europe. It was this decision which led to the revival of the 'peace' movement in Britain—mainly under the banner of the Campaign for Nuclear Disarmament—and to the launching of the largest-ever Soviet 'peace' offensive.

During the 1970s the World Peace Council, in close association with the other international front organisations,¹ was concentrating largely on the themes of '*détente*' and 'peaceful co-existence': a policy tersely described by Khrushchev as one of "*leading America to the grave with one arm around her shoulders*."²

Yuri Andropov in 1982:

*The name of Leonid Ilyich Brezhnev is linked to the triumph of the magnificent cause: the victory of communism throughout the world.*⁴

Notes and References

1 The term 'international front organisations' is used in this book only to describe international organisations controlled from Moscow. The Soviet term for them is 'international social organisations'.

2 Jan Sejna, *We Will Bury You*, p.89.

4 Lenin Day Speech, 23 April 1982.

The propaganda worth of such people, particularly retired generals, was realised by Communists in the 1930s. It was Georgi Dimitrov, Secretary-General of the Comintern, who explained in 1938 the immeasurable value that they could be to Communist 'peace' efforts:

One sympathiser is generally worth more than a dozen militant communists. A writer of reputation, *or a retired general, are worth more than five hundred poor devils who won't know any better than to get themselves beaten up by the police.* [My emphasis]⁶³

QUOTED IN: IAN GREIG, "THE ASSAULT ON THE

During the 1950s there were few, if any, retired senior officers of any repute who were prepared to pledge their support to Communist 'peace' activities. Today it is different, for there is now a modest reservoir of such figures who are so inclined. There have also been a number of pro-Nato retired officers, such as the late Lord Mountbatten and Field Marshal Lord Carver, who have spoken out against specific aspects of Nato policy. (In the case of these two, their opposition to battlefield nuclear weapons and the Trident programme, respectively, is exploited by the CND, whilst their opposition to most other CND policies is ignored.)

'Peace' movements, traditionally, have not been movements of *peace* but movements working to the advantage of a foreign power. This point has been forcibly made by Miles Copeland:

... the so-called 'peace' movement has traditionally been an instrument of war, never of peace. Soviet strategists make no secret of the fact that they regard it as an essential element of the psywar [psychological warfare] that goes into their regular military planning.

The idea of 'peace' as an instrument of war wasn't invented by George Orwell in his *1984*. It first appeared in the China of 500 BC when Sun Tzu first advanced the theory that victory in war depends less on one's own strength than on the enemy's weaknesses. His 'handbook' was devoted almost entirely to prescribing means whereby to develop weaknesses of an enemy—among them probably the first 'peace campaigns' in history . . . The distinguished historian, Arthur Schlesinger, was once challenged on this point, and when he dug into his history books *he was unable to find a single example where a 'peace' movement had ever prevented a war, but he found numerous examples where 'peace' movements had actually caused wars which otherwise might have been prevented.*⁵

-
- 5 Miles Copeland, interviewed by Carol Thatcher on LBC's 'Call-in' radio discussion, 2 January 1984. Sun Tzu was entrusted with the command of the armies of the Yangtze delta state Wu in the fourth century BC. His fundamental principles, expounded in detail in his *The Art of War*, were (1) that deception is the key to success, and (2) that the greatest generals are those who can overcome the enemy without fighting. As he wrote: "Thus a victorious army wins its victories before seeking battle; an army destined to defeat fights in the hope of winning." (Samuel B. Griffith, *Sun Tzu: The Art of War*, p.87.)
-

World Disarmament Campaign, 1980–82

The World Disarmament Campaign (WDC) was initiated by Philip Noel-Baker and Fenner Brockway in Autumn 1979. It aimed to attract public support for the 1982 United Nations Second Special Session on Disarmament (SSDII) and to

make sure public pressure is sufficient to ensure that the media gives it extensive coverage, and that the governments represented agree on a Comprehensive Programme of Disarmament and its implementation.¹

Notes and References

- 1 *WDC Bulletin*, No.5, February 1982, p.1.

In early December 1981 Lord Noel-Baker, Eirwen and Michael Harbottle, and Miss Manda Ridley, Noel-Baker's secretary, went as a WDC delegation to the Soviet Union at the invitation of the Soviet Peace Committee. During the visit they met many Soviet officials, including Aleksei Shitikov, Chairman of the Council of the Supreme Soviet, who is responsible for running the International Committee for European Security and Co-operation, a WPC front. On returning, Harbottle said that "none of us doubted the genuine display of concern on the part of the Russians at the possibility of war," and that the trip had "established a communication link which both the [WDC] delegation and the Soviet Peace Committee believe can be developed to encompass both confidence and bridge building processes."¹¹

This "link" was developed a month later, when Fenner Brockway led eighteen other 'peace' activists on a heavily subsidised trip to the Soviet Union—costing a paltry £190 each to cover the air fare.¹² All were treated like VIPs, according to a report written by Rowland Dale, Secretary of the Northern Friends Peace Board, and issued in his capacity "as organiser of the delegation":¹³

Imagine our surprise when Lord Brockway was put in a limousine, preceded by a police car, and the rest of us followed in a coach.

This cavalcade, which became familiar on every journey in Uzbekistan, proceeded with flashing blue lights to cross all the red traffic lights in our path.¹⁴

The delegation also signed a 'Joint Agreement' with the Soviet Peace Committee but only after being obliged to agree to the removal of "one or two offending passages", including one which had called upon the Soviet Union to make a 10 per cent cut in its nuclear stockpile.

The December WDC delegation had also signed an agreement, which was issued as a communiqué. A report of that trip noted that:

The Soviet Peace Committee has undertaken to obtain signatures for our WDC petition from prominent Russian men and women before SSD2, and hopefully an endorsement of the petition from the various Peace Committees in different Republics. In content, our petition is very similar to that signed by 178 million Russians before the 1978 1st Special Session on Disarmament.¹⁵

This other petition was the 'New Stockholm Appeal'—a massive Soviet propaganda exercise which the WDC knew perfectly well to have been "a world wide appeal on disarmament . . . circulated by the World Peace Council."¹⁶

APPENDIX A

CAMPAIGN FOR NUCLEAR DISARMAMENT

CHAIRMEN, GENERAL SECRETARIES AND TREASURERS

NOTE: CND's National Council in 1980-1 had Sally Davison (Communist Party) as its "National Organiser"

(a) CHAIRMEN

1958-64	Canon John Collins	
1964-67	Olive Gibbs	Labour Party
1967-68	Sheila Oakes	Labour Party (later resigned)
1968-70	Malcolm Caldwell	Marxist
1970-71	April Carter	Socialist
1971-77	John Cox	<u>Communist Party</u>
1977-79	Bruce Kent	Ex-Labour Party
1979-81	Hugh Jenkins	Labour Party
1981-85	Joan Ruddock	Labour Party

(b) GENERAL SECRETARIES

1958-66	Peggy Duff	Labour Party
1967	John Minnion	Labour Party
1967-73	Dick Nettleton	Labour Party
1973-75	Dan Smith	Labour Party
1975-79	Duncan Rees	<u>Communist Party</u>
1980-85	Bruce Kent	Ex-Labour Party

(c) TREASURERS

1978-80	Dan Smith	Labour Party
1980-82	<u>Cathy Ashton</u>	<u>Labour Party</u>
1982-	Mick Elliott	Labour Party

Joan Ruddock (Labour) was Chair of CND from 1981-85

Mike Pentz of SANA (Scientists Against Nuclear Arms) was Vice-Chair of CND from 1981-84 and CND's Vice-President from 12 January 1985.

Pentz was ex-Commie Party, like Phil Bolsover (CND VP in April 1983).

Phil Bolsover was CND National Council Member for Brighton, 1980-3.

CND Executive Committee 1983

This CND Executive Committee was elected/appointed at the first meeting of CND Council on 15-16 January 1983.

Officers

Cathy Ashton was a Vice-Chair from 1982-4.

Joan Ruddock	Labour Party	'Chairperson'
Mike Pentz	Labour Party (ex-Communist Party)	'Vice-Chair'
Cathy Ashton	Labour Party	"

Gorbachev's Economic Program: Problems Emerge

**CIA HISTORICAL REVIEW PROGRAM
RELEASE IN FULL
1999**

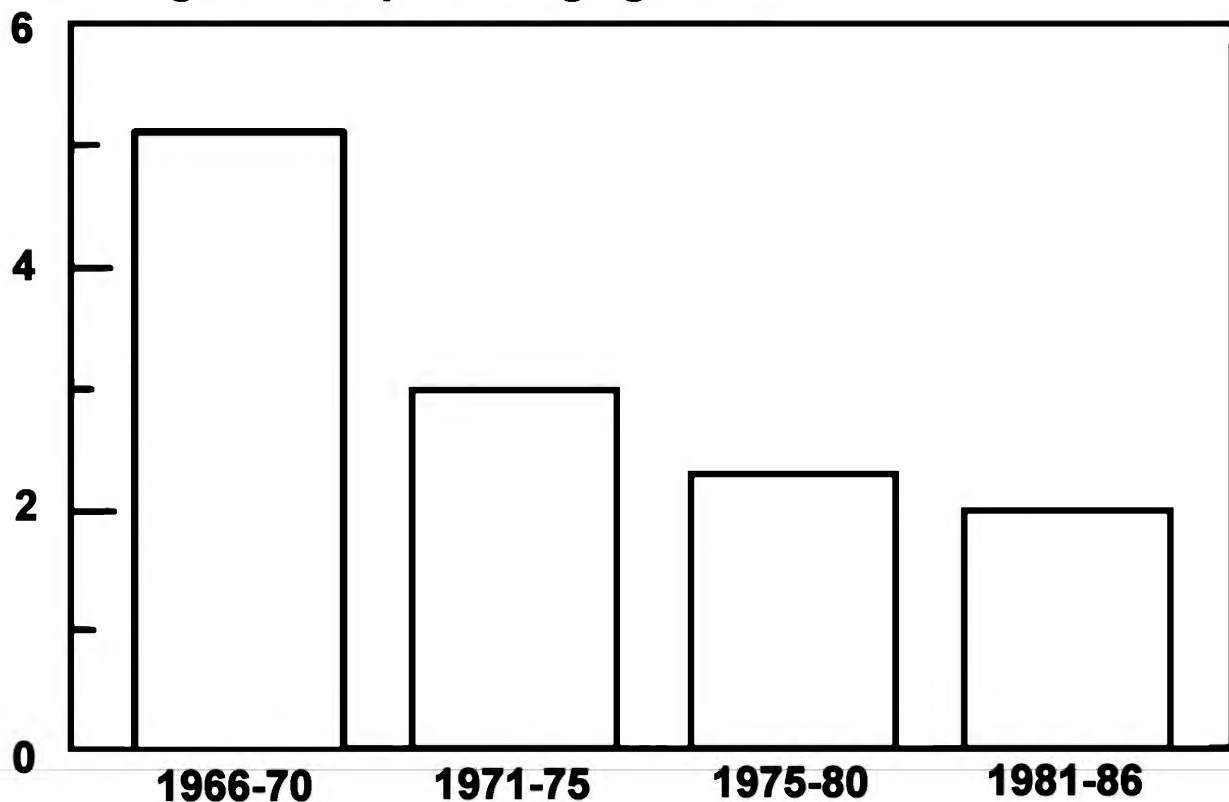


**DDB-1900-187-88
June 1988**

The Economic Slowdown

Trends in Soviet GNP, 1965-85

Average annual percentage growth



A Heavy Defense Burden

The Ratio of Selected Soviet to US

Cumulative Weapons Production, 1975-85

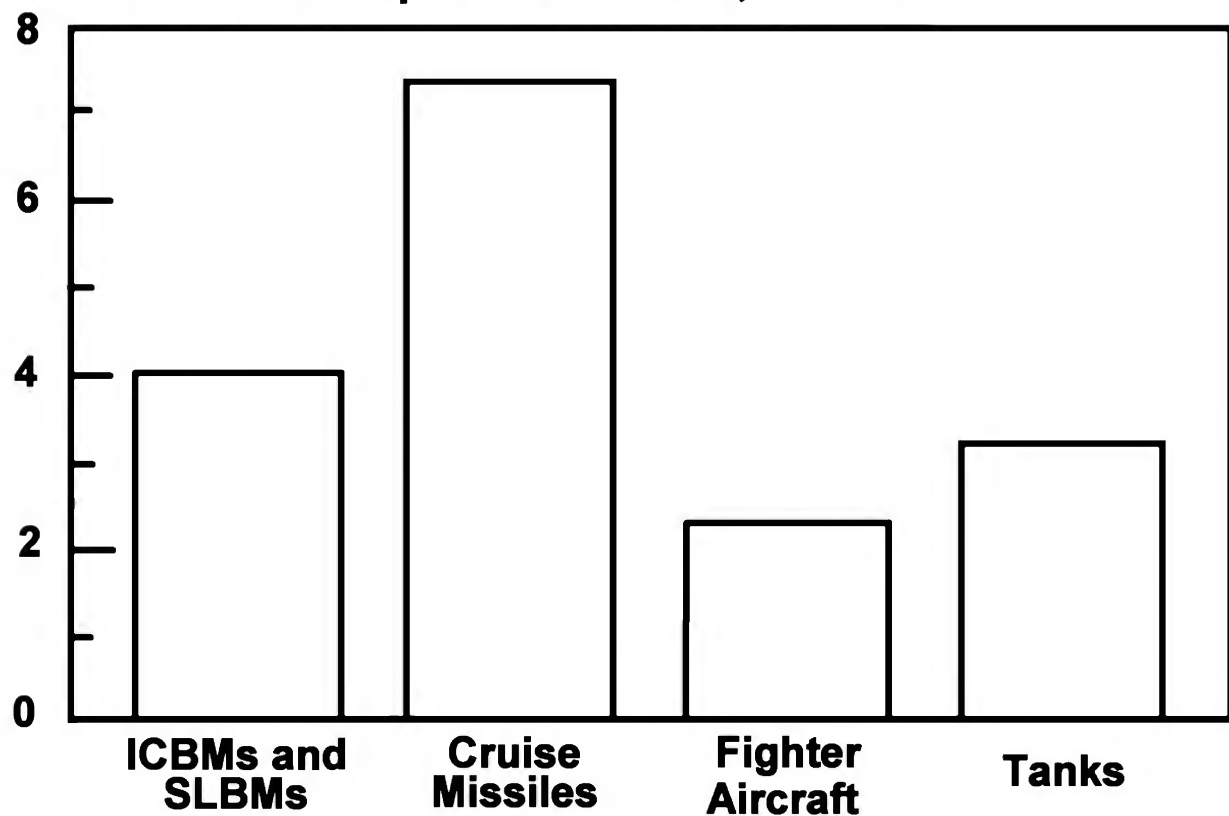


Figure 1. Gorbachev's Domestic Imperative

~~SECRET~~ ~~SENSITIVE~~

January 17, 1983

National Security Decision
Directive Number 75

Declassify/Released 7/16/94
under provision E.O. 12356
by D. Van Tassel, National Security Council
F94-1142

U.S. RELATIONS WITH THE USSR (S)

U.S. policy toward the Soviet Union will consist of three elements: external resistance to Soviet imperialism; internal pressure on the USSR to weaken the sources of Soviet imperialism; and negotiations to eliminate, on the basis of strict reciprocity, outstanding disagreements. Specifically, U.S. tasks are:

1. To contain and over time reverse Soviet expansionism by competing effectively on a sustained basis with the Soviet Union in all international arenas -- particularly in the overall military balance and in geographical regions of priority concern to the United States. This will remain the primary focus of U.S. policy toward the USSR.
2. To promote, within the narrow limits available to us, the process of change in the Soviet Union toward a more pluralistic political and economic system in which the power of the privileged ruling elite is gradually reduced. The U.S. recognizes that Soviet aggressiveness has deep roots in the internal system, and that relations with the USSR should therefore take into account whether or not they help to strengthen this system and its capacity to engage in aggression.
3. To engage the Soviet Union in negotiations to attempt to reach agreements which protect and enhance U.S. interests and which are consistent with the principle of strict reciprocity and mutual interest. This is important when the Soviet Union is in the midst of a process of political succession. (S)

In order to implement this threefold strategy, the U.S. must convey clearly to Moscow that unacceptable behavior will incur costs that would outweigh any gains. At the same time, the U.S. must make clear to the Soviets that genuine restraint in their behavior would create the possibility of an East-West relationship that might bring important benefits for the Soviet Union. It is particularly important that this message be conveyed clearly during the succession period, since this may be a particularly opportune time for external forces to affect the policies of Brezhnev's successors. (S)

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3. Political Action: U.S. policy must have an ideological thrust which clearly affirms the superiority of U.S. and Western values of individual dignity and freedom, a free press, free trade unions, free enterprise, and political democracy over the repressive features of Soviet Communism. We need to review and significantly strengthen U.S. instruments of political action including: (a) The President's London initiative to support democratic forces; (b) USG efforts to highlight Soviet human rights violations; and (c) U.S. radio broadcasting policy. The U.S. should:

-- Expose at all available fora the double standards employed by the Soviet Union in dealing with difficulties within its own domain and the outside ("capitalist") world (e.g., treatment of labor, policies toward ethnic minorities, use of chemical weapons, etc.).

-- Prevent the Soviet propaganda machine from seizing the semantic high-ground in the battle of ideas through the appropriation of such terms as "peace." (S)

B. Geopolitical

1. The Industrial Democracies: An effective response to the Soviet challenge requires close partnership among the industrial democracies, including stronger and more effective collective defense arrangements. The U.S. must provide strong leadership

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1974 CIA report on emerging USSR superiority:

NIE 11-3/8-74 Soviet Forces for Intercontinental Conflict

SUMMARY

THE USSR'S CURRENT STRATEGIC SITUATION

1. The Soviets are pressing ahead with a broad range of programs for the near-term deployment of much improved offensive systems for intercontinental conflict. In addition they are gradually improving their deployed strategic defenses, and are vigorously pursuing the development of advanced technology applicable to strategic forces.

— *In offensive forces*, they are focusing on improving the accuracy, flexibility, and survivability of their ICBMs and SLBMs and on MIRVing their ICBMs. Four new ICBMs, three with MIRV payloads, are being flight tested. A mobile version of one of the missiles probably is being developed. Hardened launch control centers are being constructed at missile complexes, and a standby airborne command post for the Strategic Rocket Forces probably now is operational. New classes of nuclear-powered ballistic missile submarines with long-range missile systems continue under construction, and a new multipurpose bomber is starting to be de-

ployed. Additional ICBMs and SLBMs are in the preflight stages of research and development.

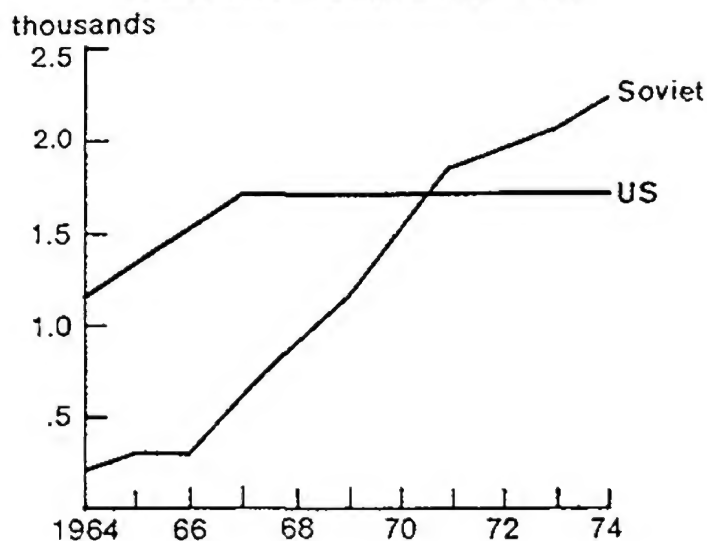
— *In defensive forces*, the Soviets are improving the capability of forces already deployed and are developing new systems. Older fighter-interceptors and surface-to-air missile systems are being phased out gradually as improved equipment is introduced. Current research and development activity includes programs for antisubmarine warfare, an antiballistic missile system which can be deployed much more rapidly than the one now operational, an endoatmospheric ballistic missile interceptor, and the application of lasers to strategic defense.

2. These developments follow a series of large-scale deployment programs over the past ten years which have provided the Soviets with a reliable deterrent and have brought about world recognition of the USSR's status as a superpower roughly on a par with the US. Through these earlier programs, the USSR has largely eliminated previous US quantitative advantages in strategic offensive forces.

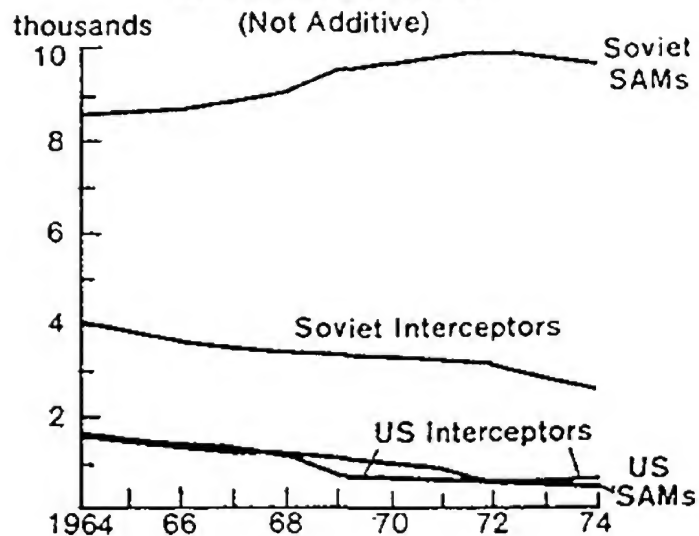
Figure 1

Historical Trends in Selected Aspects of Strategic Forces

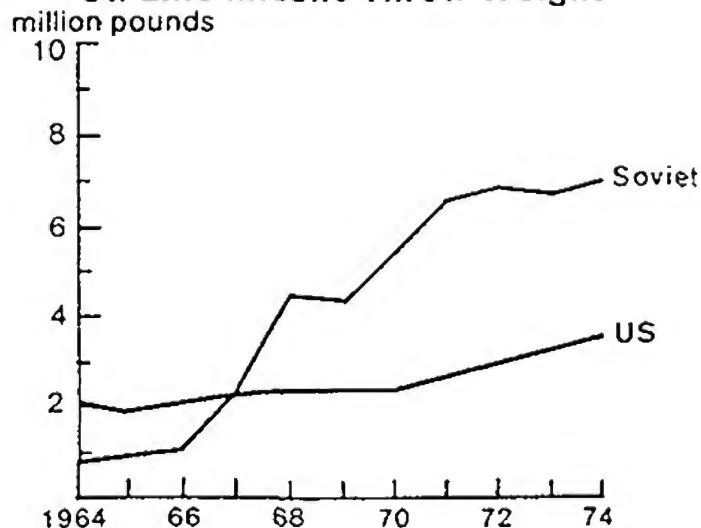
ICBM and SLBM Launchers



Defensive Forces



On-Line Missile Throw Weight



304599-11-74 CIA

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THE DIRECTOR OF CENTRAL INTELLIGENCE

WASHINGTON, D. C. 20505

**APPROVED FOR RELEASE
CIA HISTORICAL-REVIEW PROGRAM**

MEMORANDUM FOR: Recipients of National Intelligence Estimate
11-3/8-76, "Soviet Forces for Intercontinental
Conflict Through the Mid-1980s"

FROM: George Bush

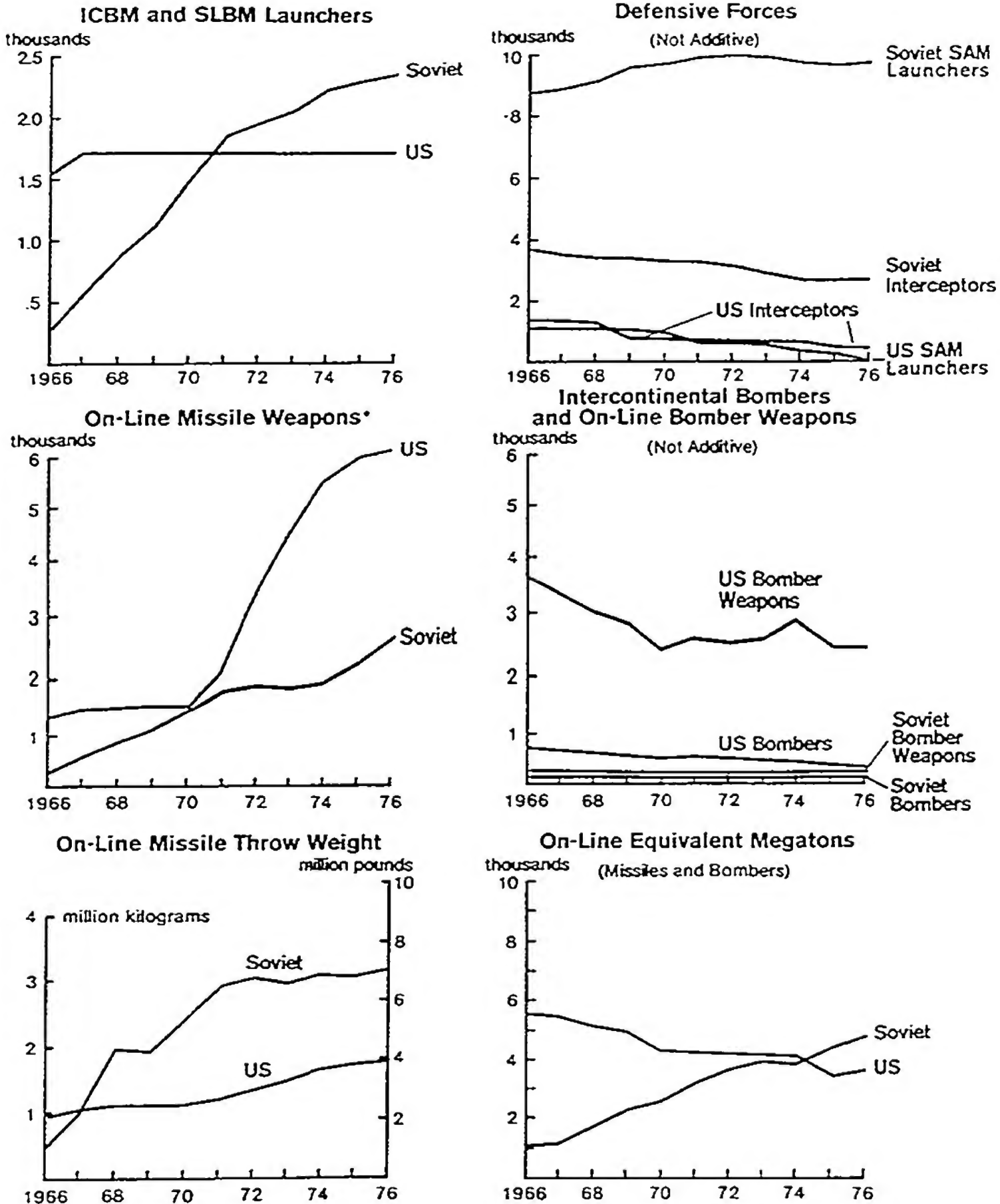
1. The attached National Intelligence Estimate is the official appraisal of the Director of Central Intelligence. This Estimate, including its italicized statements of differing views by members of The National Foreign Intelligence Board, was drafted and coordinated by professional intelligence officers of the US Intelligence Community and was approved by me with the advice of the Board.

2. The judgments arrived at in this Estimate were made after all parties to the Estimate had the benefit of alternative views from the various elements of the Community and from panels of experts from outside government on a few selected subjects. The assembling of the panels of outside experts, and the consideration of their views, was agreed upon by me and the President's Foreign Intelligence Advisory Board as an experiment, the purpose of which was to determine whether those known for their more somber views of Soviet capabilities and objectives could present the evidence in a sufficiently convincing way to alter the analytical judgments that otherwise would have been presented in the attached document. The views of these experts did have some effect. But to the extent that this Estimate presents a starker appreciation of Soviet strategic capabilities and objectives, it is but the latest in a series of estimates that have done so as evidence has accumulated on the continuing persistence and vigor of Soviet programs in the strategic offensive and defensive fields.

*NIE 11-3/8-76 Soviet Forces for Intercontinental Conflict
Through the Mid-1980s*

Classified	019305
Declassified	
Excluded	
Unreviewed	
Unclassified	

Historical Trends in Selected Aspects of Strategic Forces



* Excludes ICBM silo launchers under construction or conversion and SLBM launchers on SSBNs undergoing sea trials, conversion, or shipyard overhaul. Missile payloads composed of MRVs (which are not independently targetable) are counted as one RV.

~~SECRET~~

*NIE 11-3/8-80 Soviet Capabilities for Strategic Nuclear Conflict
Through the Late 1980s*

**APPROVED FOR RELEASE
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PART ONE—KEY JUDGMENTS

PREFACE

These Key Judgments consist of two sections. This year the Director of Central Intelligence has added his own key judgments (section A), which have not been coordinated with the Intelligence Community. He does not hold major disagreements with the key judgments coordinated by the Intelligence Community agencies (section B) or with the basic analysis in the Estimate. He does not believe, however, that the findings in section B adequately emphasize those areas of key importance to the President and his principal advisers on foreign policy. His key judgments, therefore, address what the basic Estimate tells us about the following four issues of cardinal importance to US policy on strategic forces:

- How the strategic capabilities of the two sides compare.
- What actions the Soviets may take as they view the comparative strengths of the strategic forces.
- Whether and how the balance of strategic forces prompts the Soviets to pursue strategic arms control agreements with the United States.
- Whether or not the advantages that the Soviets seem to have in ICBMs through 1986 would induce or pressure them to exploit what they might perceive as a "window of opportunity" before those advantages may be erased toward the end of this decade.

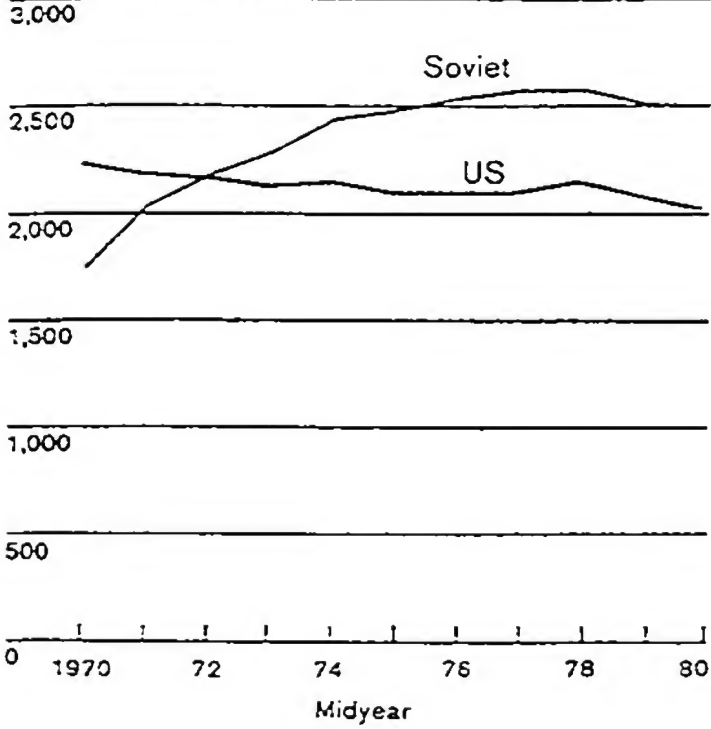
A. KEY JUDGMENTS OF THE DIRECTOR OF CENTRAL INTELLIGENCE

Soviet Perceptions of the Strategic Environment

1. The comprehensive nature of Soviet strategic offensive and defensive programs, the emphasis in Soviet military doctrine on capabilities to fight a nuclear war, and assertions that general nuclear war can be won indicate that some Soviet leaders hold the view that victory in general nuclear war is possible. The Soviets assert that a general nuclear war will probably be brief, but we believe that they have

Figure I
Comparison of Soviet and US Forces for Intercontinental Attack, 1970-80

Number of Delivery Vehicles



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LA-14066-H
History

*Tracing the Origins of the W76:
1966–Spring 1973 (U)*

Betty L. Perkins

November 3, 2003

Redacted Version

~~NUCLEAR WEAPON DATA~~

~~Sigma 1~~

~~Critical Nuclear Weapon
Design Information~~

~~DoD Directive 5210.2 Applies~~

~~RESTRICTED DATA~~

~~This document contains Restricted Data as
defined in the Atomic Energy Act of 1954.
Unauthorized disclosure subject to
administrative and criminal sanctions.~~

Classifier: Michael Pankratz

Derived from: LA-4000, Rev. 8, 9/02
July 14, 2003


• **Los Alamos**
NATIONAL LABORATORY

Los Alamos NM 87545

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7. Yield: The Confetti Argument

Agnew felt that the yield of the W68 was too low to be really effective. In addition, in terms of the overall total yield available from all the W68 warheads, the W68 design was very costly in terms of the amount of required special nuclear materials.

In an April 1972 TWX to Assistant Director for Safety and Liaison (Division of Military Application) Colonel Robert T. Duff, Agnew reported that he was worried about maintaining the U.S. nuclear deterrent. Agnew noted, "It occurs to me that as we go to lower and lower yields in our strategic missile warheads and the Soviet Union builds up a better and better civil defense position, the reality of this deterrent may become questionable.

(b)(3)

If the Soviet leadership believes this, then our strategic deterrent will have lost a good deal of its force. If our MIRV trend continues we'll be threatening to throw confetti at a potential aggressor. Confetti has high penetration and survivability but little deterrent power."²⁸¹

In a letter dated October 10, 1972, to Giller, at that time Assistant General Manager for National Security, Agnew again noted several reasons why low yield warheads might not be the best solution for maximizing the deterrence capability of the stockpile. He reported that considering the number of required submarines and the low efficiency in their use of special nuclear material, the low-yield warheads were not very cost effective. Moreover, Agnew pointed out that for the Hiroshima device, the effects on Hiroshima in terms of loss of substantial buildings and the people in them "wasn't all that impressive." In terms of loss of life, the USSR had lost more than ten million people in WWII. Although the Soviets had an extensive civil-defense network in place, even if that did not work to reduce loss of civilian lives, the Soviets might not mind losing a few people. Agnew wrote, "Again, to me, to continue to increase warhead numbers at the cost of a decrease in yield per warhead could eventually lead to no deterrence in the minds of those we hope to deter." Agnew stated, "I feel very strongly that we should endeavor to convince the DoD that what they should have on the next round is a mix of yields.

(b)(3)

8. Capability

Agnew in his August 10, 1972, letter to Camm pointed out that the Los Alamos group had been developing suitable technology applicable to the new strategic missile warheads. He wrote, "In summary then, we have been working very hard to provide the very latest technology in warhead designs incorporating the most advanced minimum weight hardening techniques to provide an optimum warhead for the next round of strategic missile warheads. In fact, our work has been of such outstanding quality that we have been invited by Admiral Levering Smith to

²⁸¹H. M. Agnew, University of California, Los Alamos Scientific Laboratory, Los Alamos, N.M. to BY3/Colonel Robert T. Duff, USAF, Assistant Director for Safety and Liaison, Division of Military Application USAEC, Wash., D.C. (SRD) (April 14, 1972), pp. 1-2, B11, Drawer 56, Folder 1 of 4.

(b)(3)

~~SECRET~~

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~~SECRETARY~~

3. Reservoir Designs to Provide Minimum Helium in the Boost Gas

In a March 1969 memo, primary designer R. Canada outlined the problems that were the result of the formation of ^3He from the decay of the tritium used in the primary's boost gas.

(b)(3)

The yield of a boosted primary is degraded as tritium is converted to ^3He both by the loss of the source of 14-MeV neutrons and also by the decrease of the pre-boost multiplication rate caused by the high cross-section for neutron capture which is characteristic of ^3He ." He went on to add, "In a conventional boosted single-stage device the tritium produced by ^3He appears too late in the bomb's explosion to contribute to the yield, and the temperature does not get high enough to produce significant $^3\text{He} + \text{D}$ fusion."²⁹³

(b)(3)

²⁹³R. Canada to Distribution, Subject: " ^3He in Weapons," W-4-2518 (SRD) (March 10, 1969), 5 pp., A99-019, 199-13.

(b)(3)

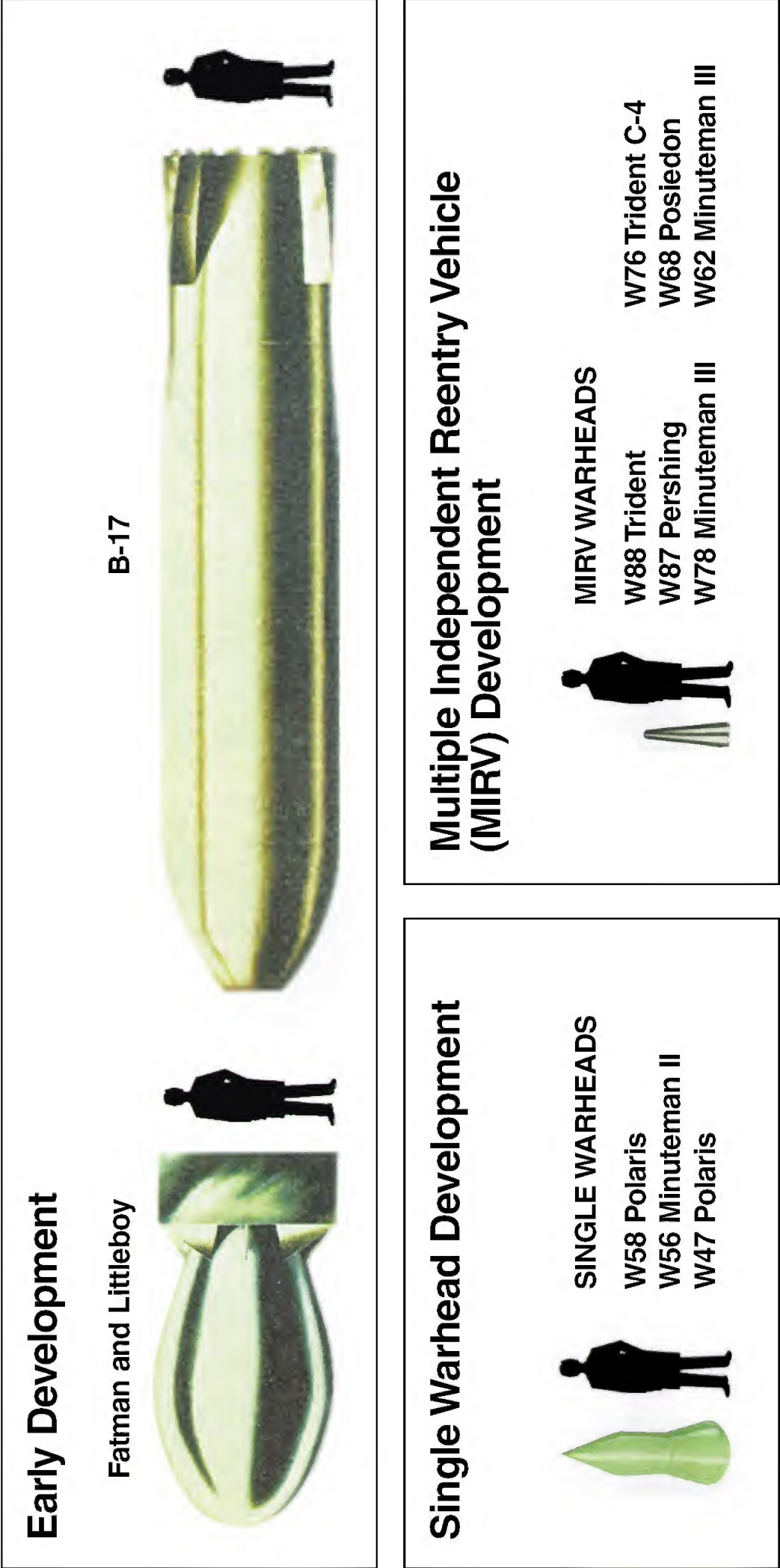
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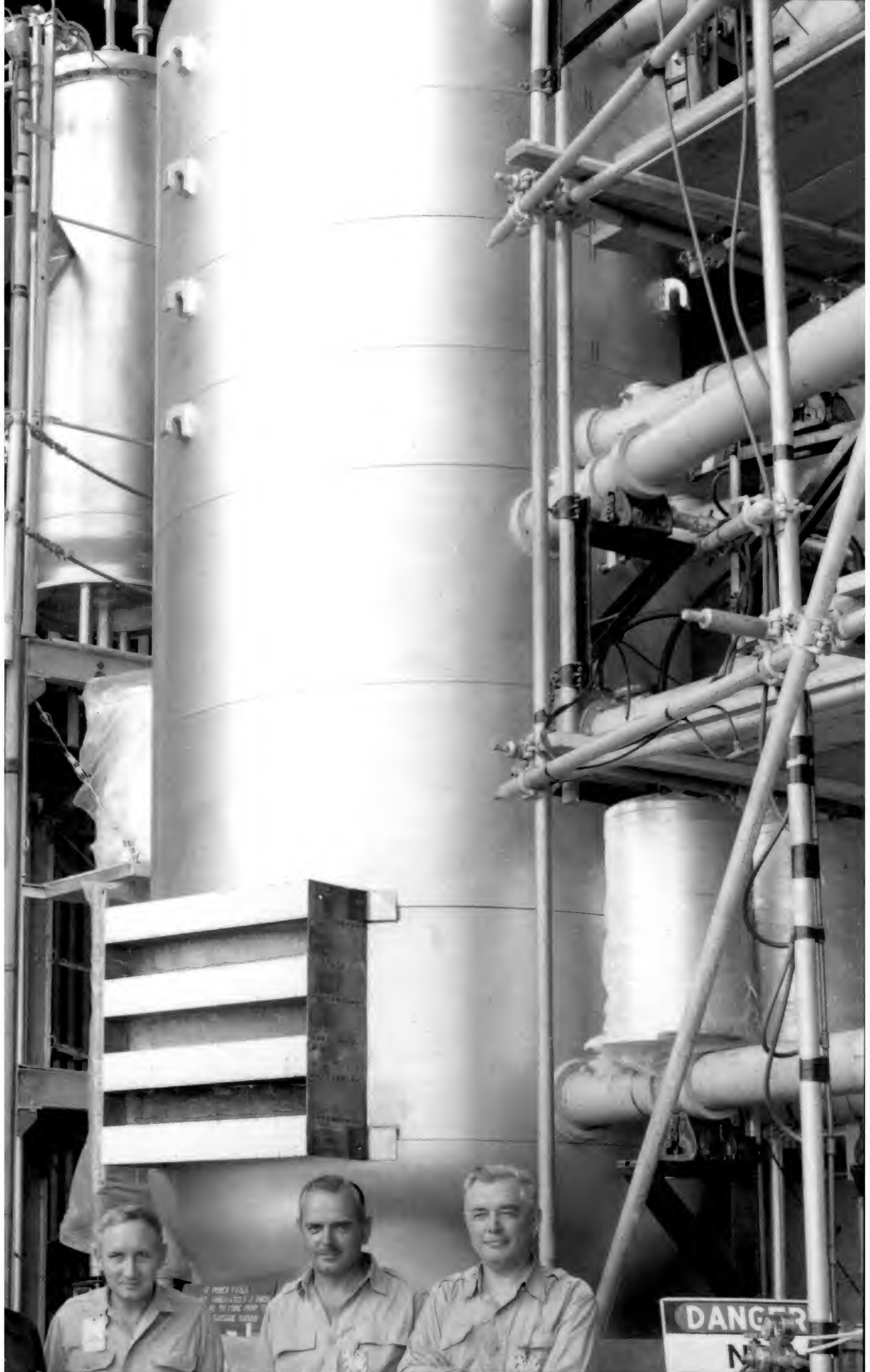
Trident II missile test, U.S. Department of Defense photo



Size Comparison of U.S. Nuclear Warheads



The first U.S. nuclear warheads, such as Fatman, Littleboy and the B-17, were very large in size. Over time, as technology became more sophisticated, the warheads shrunk in size.



10 megatons Mike (1952) won't fit in MIRV warheads!

18th February, 1954

DEVASTATION OF HYDROGEN WEAPON

Island Obliterated in U.S. Test

Chicago, February 17

The chairman of the Joint Congressional Atomic Energy Committee, Mr. Sterling Cole, hinted to-day that the United States might have hydrogen weapons even more potent than the experimental one which tore a crater a mile wide and 175 feet deep in the floor of the Pacific Ocean in 1952.

He said that the United States had "in being" an entire family of atomic weapons, some of them 25 times more powerful than the bomb that destroyed Hiroshima in 1945.

Mr. Cole gave details of the 1952 experiment in a speech at a commercial lunch here. He said:

"The thermo-nuclear test of 1952 completely obliterated the test island in the Eniwetok Atoll. It tore a cavity in the floor of the ocean - a crater measuring a full mile in diameter and 175 feet in depth at its lowest point. Within this crater, one could place 140 structures the size of our nation's Capitol.

If it occurred in a modern city, I am told that the heat and blast generated in the 1952 hydrogen test would cause absolute destruction over an area extending three miles in all directions from the point where the hydrogen device exploded.

This is an area of complete devastation - using the word 'complete' in its most precise meaning - six miles in diameter. The area of severe-to-moderate damage would stretch in all directions to seven miles from ground zero.

Finally, the area of light damage would reach to ten miles from the point of detonation. In other words, an area covering 300 square miles would be blanketed by this hydrogen explosion."

Because of what he called "the appalling meaning of the hydrogen bomb." Mr. Cole said that "it is not enough to notify an enemy that the attempted destruction of our own cities would be automatically answered by the destruction of his."

"Atom-Rattling"

Mr. Cole said that security prevented him from commenting on where "our hydrogen weapons programme now stands and from outlining the directions in which it is now moving, but I can assure you that it is moving." He felt that "it is more sinful to conceal the power of the atom than to reveal it."

Table 3.1—FIREBALL YIELD, MIKE*

Data: EG&G Eastman films: 16102, 16103, 16104, 16110, 16111; plus three Rapatronics				Analytic Solution		Ambient conditions: Pressure (P ₀), 0.951 bar Density (ρ ₀), 1.10 g/liter Sound velocity (C ₀), 0.348 meter/msec		
Time (t), msec	Radius (R), meters	Shock velocity $\left(\frac{U}{C_0}\right)$	Pressure $\left(\frac{P}{P_0}\right)$	Slope (n ²)	ϕ^5 $\left(\frac{R^5}{t^2}\right)$	Factor (F)	Yield (W), Mt	
22.628	492.0	23.3	690	0.1387	180.1	2.447	10.5	
32.000	560.0	18.8	450	0.1399	173.5	2.557	10.8	
45.256	637.5	15.16	290	0.1402	164.8	2.643	10.5	
64.000	727.6	12.40	193	0.1439	158.8	2.651	10.4	
90.512	829.9	10.13	126	0.1479	154.0	2.594	10.2	
128.000	949.0	8.36	85	0.1539	150.8	2.556	10.2	
181.024	1087.6	6.90	57.5	0.1599	148.5	2.452	10.0	
Av. (statistics only)							10.4 ± 0.1	
ϕ^5 Scaling								
		$\phi = 272.8$	$W = 11.2 \pm 0.6$ Mt					
Recommended preliminary hydrodynamic yield = 10.4 ± 0.5 Mt								

* Ambient conditions were taken at average fireball height; a reflection factor of 2 was applied to the yield. The EG&G value of yield was based on $\rho_0 = 1.15$ g/liter; it would become 10.7 Mt for $\rho_0 = 1.10$ g/liter.

Leader-Republican

GLOVERSVILLE AND JOHNSTOWN, N. Y., WEDNESDAY, FEBRUARY 17, 1954

Rep. Cole Hints America Possesses Super H-Bomb

Claims It 'Sinful' To Conceal Power Of Nuclear Project

Much Progress Made Since 1952 Blast Which Obliterated Test Island at Eniwetok, Tore Mile-Wide Ocean Hole

CHICAGO (AP)—A congressional atomic specialist hinted today the United States may have hydrogen weapons even more potent than a device that nearly 18 months ago tore a hole a mile wide and 175 feet deep in the floor of the Pacific Ocean.

Rep. W. Sterling Cole (R-NY), chairman of the Senate-House Atomic Energy Committee, gave details never before discussed publicly of a 1952 thermonuclear test in the Marshall Islands. President Eisenhower has termed that test a first step in the nation's hydrogen program.

Cole said in a speech prepared for a joint luncheon of the 38th annual National Sand and Gravel Assn. convention and the 24th annual National Ready Mixed Concrete Assn. convention:

Wiped Out Island
"That thermonuclear test of 1952 completely obliterated the test island in the Eniwetok Atoll.

"It tore a cavity in the floor of the ocean—a crater measuring a full mile in diameter and 175 feet in depth at its lowest point.

"Within . . . this crater, one could place 140 structures the size of our nation's capitol."

If this blast had been touched off in a modern city, Cole said, the resultant heat and blast would have completely devastated an area three miles in all directions from the point of explosion.

Much Destruction

In all, he said, the 1952 blast would have blanketed an area of 300 square miles.

But this test was held almost a year and a half ago, Cole said, and he added:

"Security keeps me from commenting on where our hydrogen weapons program now stands, and from outlining the directions in which it is now moving. But I can assure you that it is moving."

Cole said he feels "it is more

Cut In Supports Could Hike Milk Consumer Costs

Dairy Economist Fears 1.5 Cent Boost Per Quart

SYRACUSE (AP)—The forthcoming cut in federal price supports on butter, cheese and dried milk could result in a 1½-cent, per-quart boost in the retail price of fluid milk in New York State, a dairy economist says.

John C. York, economist for the Eastern Milk Producers Cooperative Assn., reasons this way:

When price supports at 75 per cent of parity become effective April 1, each dairy farmer in the state probably will get 25 to 30 cents less per hundredweight (about 47 quarts) for the milk he sends to market.

If farmers were to get back on milk sold for bottling the money lost on milk sold for butterfat and manufacturing, consumers eventu-

Ike Requests A-Sharing With Allies

Would Cover Data For Battlefield, Peacetime Uses

WASHINGTON (AP)—President Eisenhower asked Congress today for authority to share limited information on battlefield use of atomic weapons with friendly nations.

In a special message, the President also asked for the right to share peacetime atomic power production information with this country's allies and to give American private industry a greater share in the development of nuclear power.

Eisenhower said these steps would have the effect of "strengthening the defense and the economy of the United States and of the Free World."

The President said the onward rush of atomic developments has outmoded the 1946 Atomic Energy Act which mistakenly assumed the United States could maintain a monopoly in atomic weapons for an appreciable time.

Wide Variety

Counterbalancing the loss of monopoly, he said, is the development of a wide variety of atomic weapons which have "achieved conventional status" in the armed forces.

He said with emphasis, however, that changes should "make it clear that the authority granted must be exercised only in accordance with conditions prescribed by the President to protect the common defense and security." And he stressed that no secrets are to be given away which would be of military advantage to potential enemies.

Cannot Help Out

Under present law, the President said, this country cannot give its allies "practical information essential to their effective participation with us in combined military operations and planning, and to their own defense against atomic attack."

Plattsburgh Press-Republican

Your "Good Morning" Newspaper Serving The North Country

161.

Member of The Associated Press

Plattsburgh, New York, Thursday, February 18, 1954

Telephone: Plattsburgh 77

Cole Hints H-Bomb More Destructive

CHICAGO, Feb. 17 (AP)—A congressional atomic authority hinted today that the United States may have increased the destructive potential attained in its first full-scale hydrogen explosion and is working toward development of a versatile line of hydrogen weapons.

Rep. W. Sterling Cole (R-NY) revealed officially for the first time that the 1952 thermonuclear test in the Marshall Islands completely obliterated the test island in the Eniwetok Atoll and gashed a crater in the ocean floor a full mile in diameter and 175 feet deep at its lowest point.

He said the explosion crater was large enough to hold 140 structures the size of the nation's capitol.

Cole said Russia soon will have the capacity to hit the United States with a crippling hydrogen and atomic blow. But, he added, it's "entirely within our capacity" to produce "tens of thousands" of atomic anti-aircraft defensive missiles as "a barrier of atomic firepower."

Cole, chairman of the Senate-House Atomic Energy Committee, said the 1952 American hydrogen blast, if exploded over a modern city, would have:

Blanketed an area covering 300 square miles.

Created an area of complete devastation six miles in diameter.

Spread moderate to severe damage seven miles in all directions.

Resulted in damage as far as 10 miles from the point of explosion.



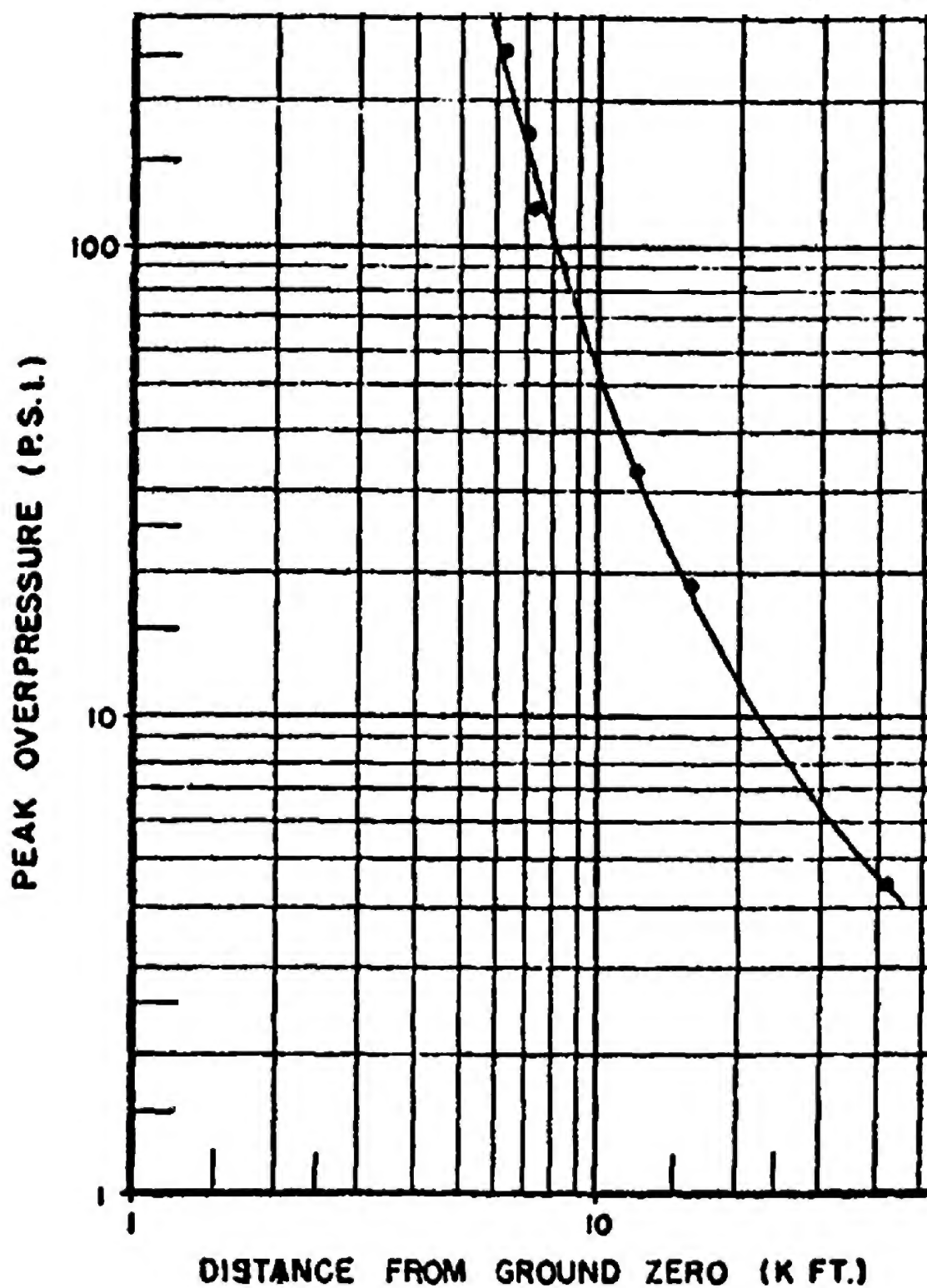
Bravo 15 Mt bomb arriving at Namu Island on 20 Feb. 1954

Figure 3.1

Bravo

Shot 1

WT-905




Castle Bravo, 15 megatons, was also too big and heavy for a MIRV missile warhead, like the Minuteman or Trident! CND were fed lies by the "Moscow World Peace Council" (USSR).



B61 nuclear weapons ready for use (Los Alamos National Laboratory photo)





THE SECRET OFFENSIVE

CHAPMAN PINCHER

the author of
Their Trade Is Treason

*The Soviet Challenge
to Western Freedom*

THE SECRET OFFENSIVE

Active measures:

**A Saga of Deception, Disinformation,
Subversion, Terrorism, Sabotage and
Assassination**

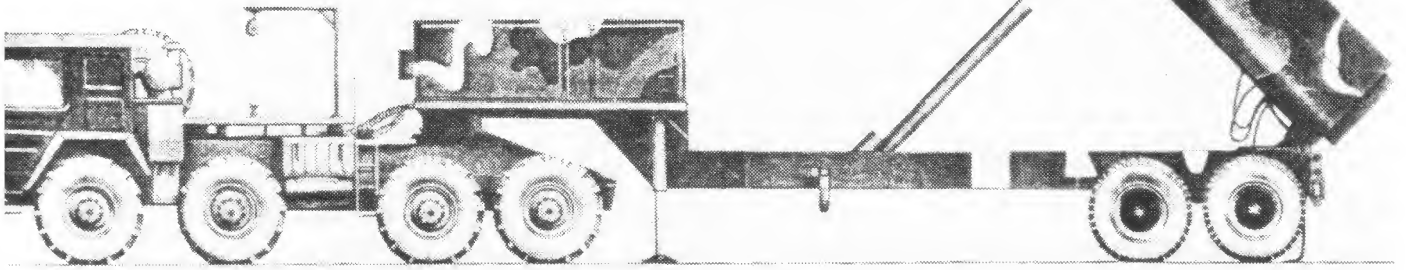
Chapman Pincher

**SIDGWICK AND JACKSON
LONDON**

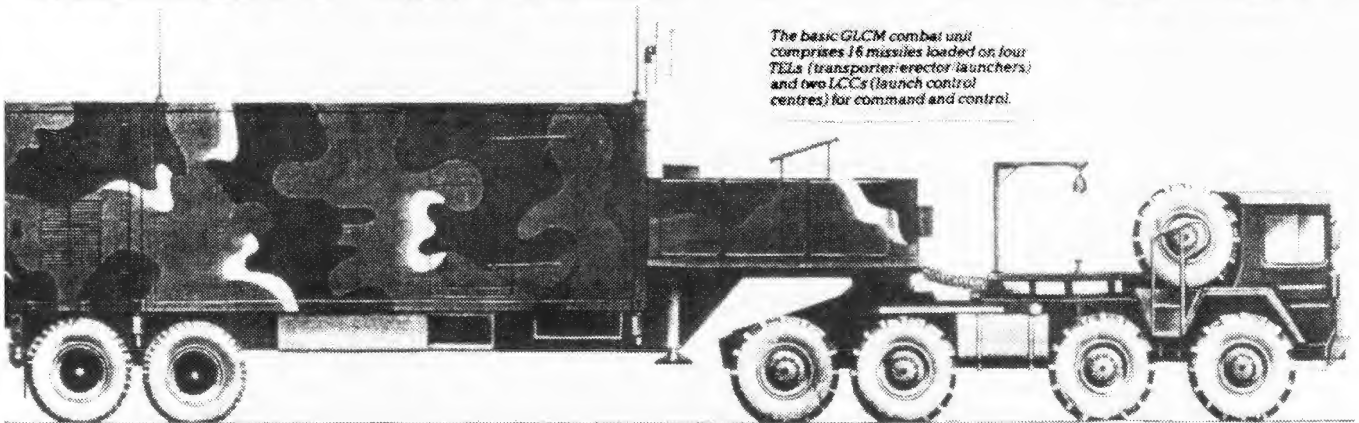
1985, revised 1986.

How we stop the Cruise launcher

Here the TEL is shown parked in the firing mode with the quad missile box elevated. The LCC seen below contains all systems needed for a two-man crew to target and fire.

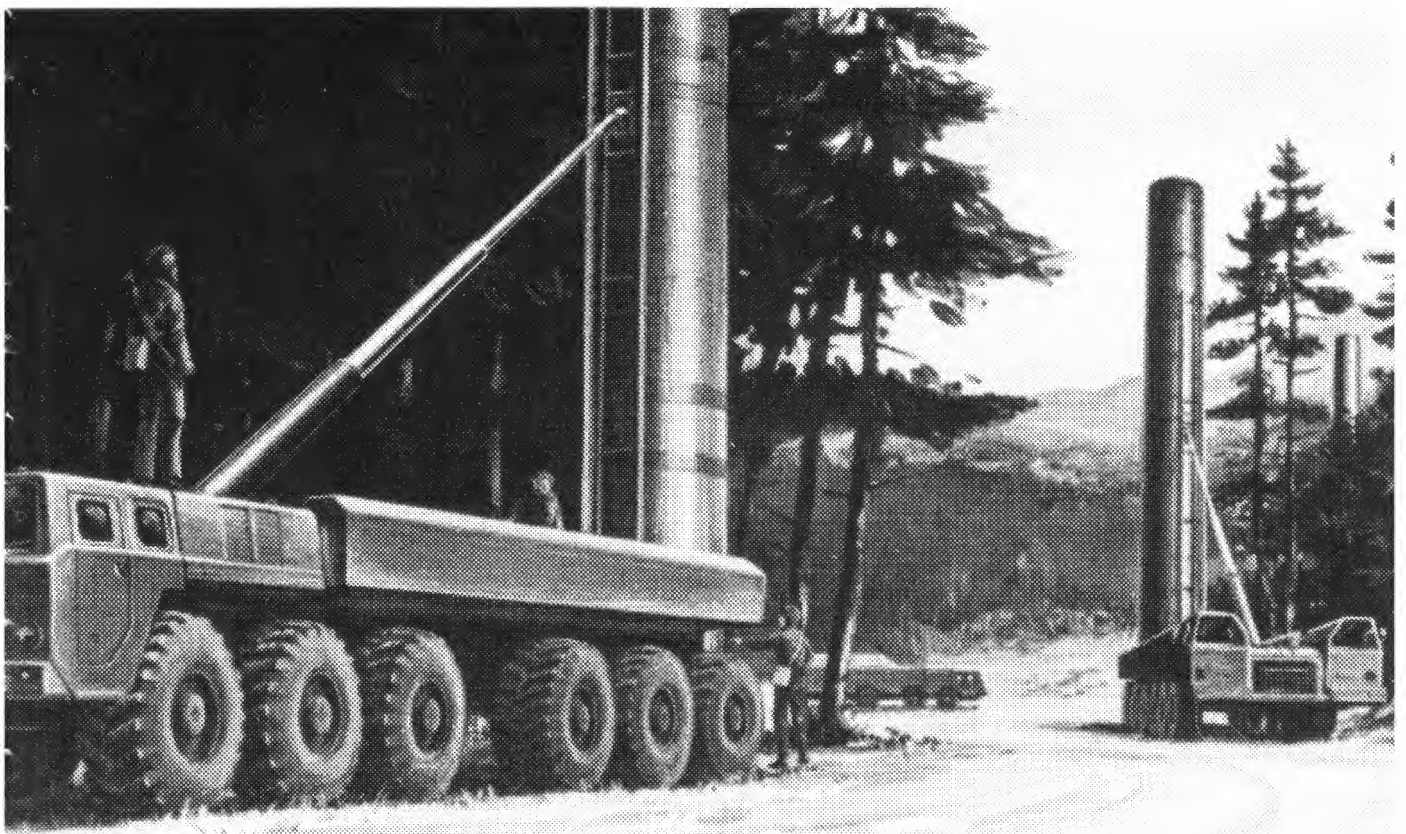


The basic GLCM combat unit comprises 16 missiles loaded on four TELs (transporter/erector launchers) and two LCCs (launch control centres) for command and control.



Part of a detailed document issued to 'peace' protesters to explain how they should try to stop the deployment of cruise missiles from their bases, either on practice runs or in an emergency

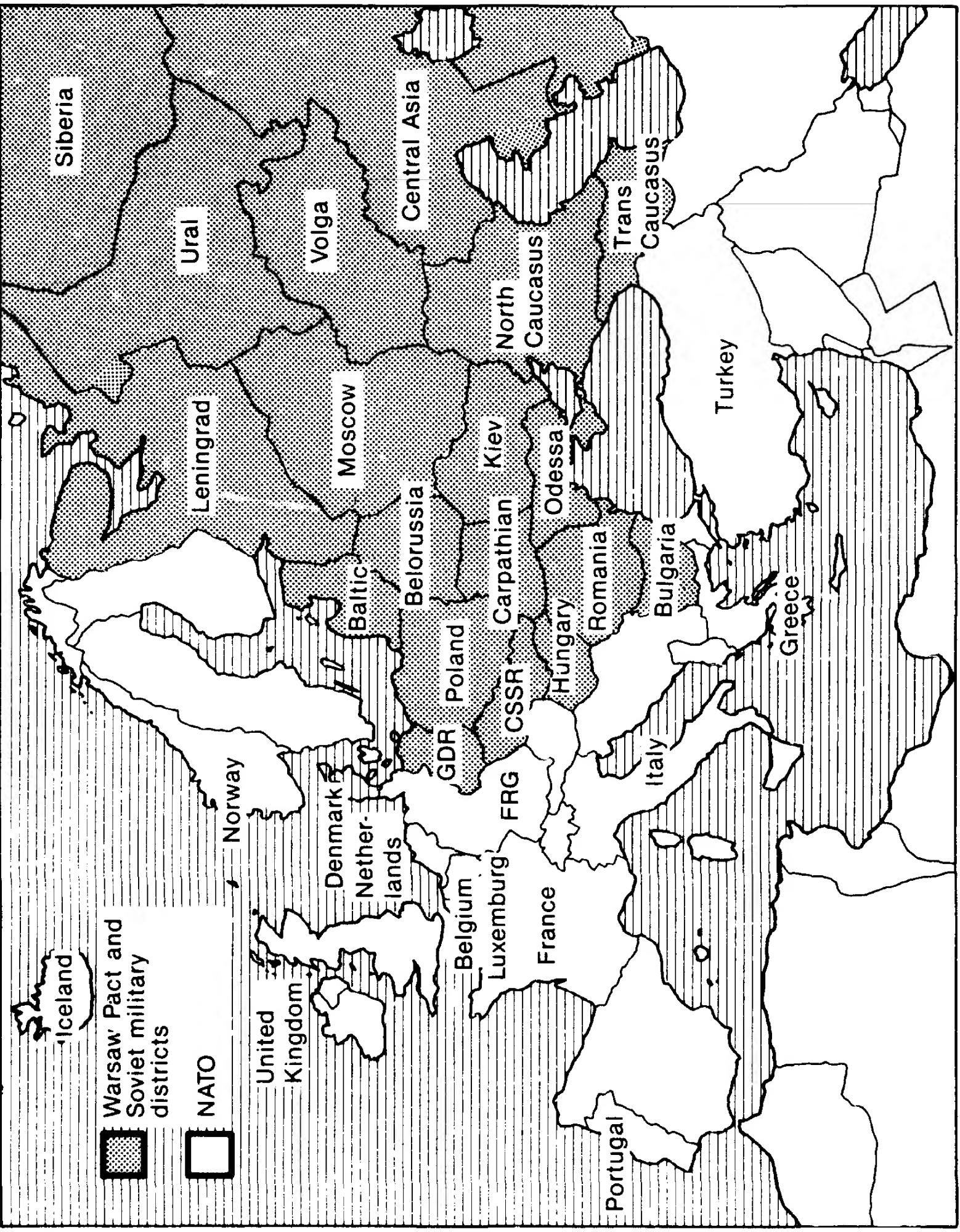
An artist's impression of Soviet SS20 missiles – part of a force of more than 400 – ready for launching from a forest clearing at West European targets. The missiles have a range of up to 3000 miles (*Soviet Military Power*)

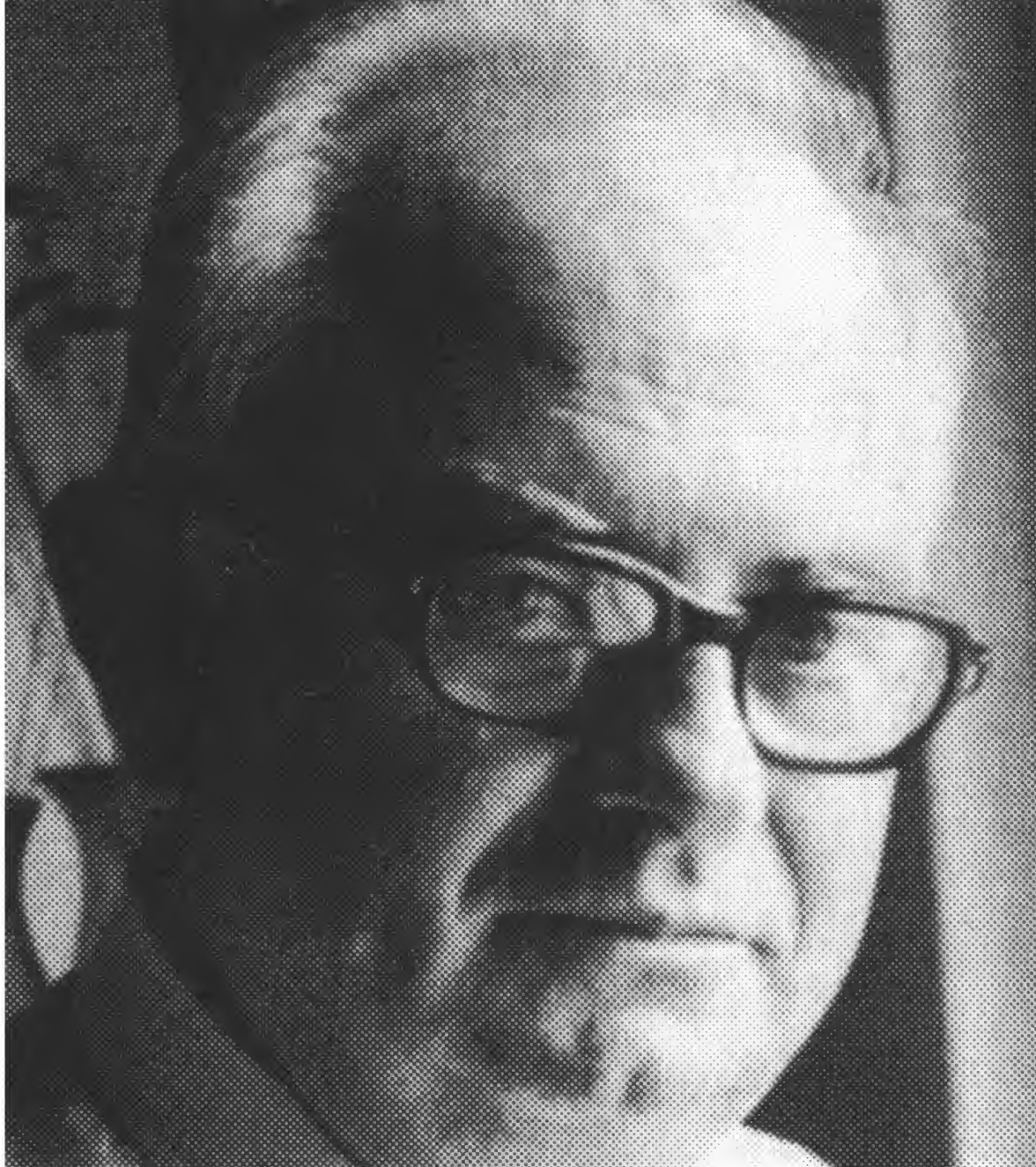




Rudolf Augstein, the chief Executive of *Der Spiegel* magazine, being arrested on charges of security breaches following publication of an article which was critical of the NATO exercise Fallex '62

On 10 October 1962 *Der Spiegel* published a long article, entitled 'Bedingt abwehrbereit' (meaning 'Conditionally Prepared for Defence'), which gave accurate details about a NATO exercise code-named Fallex '62 together with secret NATO assessments of its consequences. The exercise, which had been carried out in Western Europe during the previous month, was the first to be based on the assumption that an attack by the Soviet and Warsaw Pact forces on Central Europe would initiate a Third World War.





Wilfred Burchett page 113

Burchett, who had been a secret member of the Australian Communist Party, which his father had helped to found, began his clandestine career by volunteering information to the Russians following a trip he had made to the German rocket centre at Peenemunde in 1947. A KGB officer working under the cover of being a Soviet journalist reported to Moscow that Burchett wanted to 'sell himself' and Moscow was quick to 'buy' him.³ Burchett had previously been in touch with the Soviet Ambassador in London, Maisky, who had chosen him to run the Intourist Office there at the early age of twenty-six. He soon became known to MI5 as a dangerous Communist, my evidence for that being a personal contact which I made with Burchett in October 1946 . . .

Reference 3: the KGB agent was Yuri Krotkov (alias George Karlin); U.S Senate Subcommittee on Internal Security, 3-5 November 1969.

After leaving the *Daily Express* Burchett covered the trial of Cardinal Mindszenty, indicating his guilt, and performed similar pro-Communist tasks when reporting other show-trials in Hungary and Bulgaria. During the Korean War he reported from the Communist side as correspondent for the French Communist newspaper, *L'Humanité*. Among the disinformation he purveyed was the false claim that the Americans were using germ warfare in both North Korea and northern China. He appeared in a prisoner-of-war camp in North Korea, interrogating British and American prisoners and editing 'confessions' extracted under harsh treatment to 'prove' the germ warfare lie.⁵ One prisoner testified that Burchett, who wore a Chinese military uniform, warned him that he could have him shot and that it would be a 'good thing' if he were shot.⁶ Some of this evidence became public during a libel action which Burchett brought in Australia after it had been alleged that he had been in the pay of the KGB. Burchett lost.⁷

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Burchett, who was married to a Bulgarian, remained an active disinformation agent until he died in Sofia in September 1983. In a fulsome obituary in the *Guardian*, the far-left journalist John Pilger described him as a journalist who 'did not believe objectivity was a holy grail, an end in itself, but only one means to the truth'. The American writer Reed Irvine more accurately described him as:

a prime example of the success the Communists have had in insinuating their propaganda into the media of the Free World. Even though he had been exposed as having been on the KGB payroll and had, notoriously, served the Communists during both the Korean and Vietnam wars, Burchett had many friends among the Free World journalists and was able to get his articles placed in influential publications such as the *New York Times*.⁹

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6. The prisoner was British, Derek Kinne.
 7. The prisoner abused by Wilfred Burchett testified, so Burchett lost his case in November 1974 and paid heavy court costs. Yuri Krotkov of the KGB admitted Burchett was a spy in evidence to the US Senate Subcommittee on Internal Security, 3-5 Nov. 1969 as George Karlin, after his defection.
 9. See "Penetration of the American Mass Media"

NLE MR Case No. 87-232

Document No. 9

OFFICE OF THE DIRECTOR



UNCLASSIFIED

Mr. Coyne

RADIATION FALL-OUT" CONTROVERSY
UNITED STATES DEPARTMENT OF JUSTICE
FEDERAL BUREAU OF INVESTIGATION

WASHINGTON 25, D. C.

June 19, 1957

PERSONAL AND CONFIDENTIAL
VIA LIAISON

Honorable Robert Cutler
Special Assistant to the President
Executive Office Building
Washington, D. C.

DECLASSIFIED BY 275 WFW/mdm
ON 1/19/88
NLE 87-232

Dear General Cutler:

I thought you would be interested in the results of an analysis of the controversy being waged at the present time concerning the hazards of radiation effects from nuclear bomb tests, and I am enclosing a copy of this analysis for your information. Your attention is invited to the brief Introduction which appears at the beginning of the enclosure. u

This analysis reveals some of the efforts being made by communists on an international level and also by the Communist Party, USA, to exploit the present "fall-out" controversy. An outstanding feature of this controversy concerns the numerous scientists with subversive affiliations who have become associated with it. Dr. Linus Pauling, Harlow Shapley, and Edward U. Condon, familiar names in the field of science frequently associated with communist front activities in the past, are among those creating fear, misunderstanding, and confusion in the minds of the public on this issue. u

Sincerely yours,

J. Edgar Hoover

Enclosure



UNCLASSIFIED

DECLASSIFIED	
Authority	MR 87-232 49
By	Lko
Date	1/29/88
NLE Date	

UNCLASSIFIED
CONFIDENTIAL

**COMMUNIST EXPLOITATION OF
RADIATION "FALL-OUT" CONTROVERSY**

June 12, 1957



UNCLASSIFIED
CONFIDENTIAL

DECLASSIFIED WITH DELETIONS	
Agency Case	_____
NLE Case	<u>87-232nd 10</u>
By	<u>LHO</u> NLE Date <u>1/29/18</u>

UNCLASSIFIED
CONFIDENTIAL

I. INTRODUCTION

Communists throughout the world are exploiting the present public controversy concerning the hazards of radiation "fallout" from nuclear bomb tests. Since 1946, basic Soviet strategy has been directed at impeding and deterring the development of nuclear weapons in this country. The present efforts of communists to exploit the "fall-out" issue are in accordance with this basic strategy.

Much of the communist agitation on the "fall-out" issue stems from a communist front organization. In 1956, the World Federation of Scientific Workers (WFSW), an "international communist front," prepared and published a 40-page booklet entitled Unmeasured Hazards, which specifically discussed the harmful effects of radiation "fallout." The booklet was published in English, French, Russian, Chinese, German, and Japanese. It was distributed in the United States by the American Association of Scientific Workers (AASW), which maintains fraternal ties with the WFSW. It should also be noted that Dr. Linus Pauling, a focal point in the present "fall-out" controversy, has been one of the vice presidents of the AASW for several years.

The Communist Party, USA, is also actively exploiting the issue. On May 19, 1957, for instance, The Worker, weekend edition of the east coast communist newspaper, the Daily Worker, featured a special four-page supplement which emphasized the danger of excess radioactivity. Over 40,000 copies of this supplement have already been ordered by Party districts for distribution throughout the country. In addition, on May 27, 1957, Eugene Dennis, secretary of the Party's national affairs department, instructed all Party members to attempt to organize a nationwide campaign in protest over the continued testing of nuclear weapons. All Party districts were instructed to advise the Party's national headquarters of any action by municipal, county, or state bodies calling for a ban on nuclear weapons; any protests by local noncommunist organizations over the continued tests; any surveys to determine the presence of excess radioactive material in water supplies or dairy products; and any unfavorable editorial comment on statements by prominent individuals against the further testing of nuclear weapons. Dennis explained this information was necessary so the Daily Worker could afford this issue "major attention and emphasis."



On an individual basis, a number of persons with subversive affiliations have been featured prominently in this "fall-out" controversy in both the communist and noncommunist press.

UNCLASSIFIED
CONFIDENTIAL

ON THE POWER OF NUCLEAR ENERGY

ATOM CLOUD COVERS UK

THE Russian radiation cloud last night covered the whole of Britain as UK nuclear power stations faced a shut-down in a pay row.

A threatened walkout by electricians and engineers would hit safety inspections and repair work forcing some plants to close.

American scientists, based in Britain, flew to Russia yesterday to carry out radiation tests in Moscow following the Chernobyl disaster.

The disaster was blamed on human error by the Russians yesterday.

Iodine anti-radiation tablets can make people impotent, the health department warned. Worried parents have been trying to get the tablets for their children but experts say the contamination levels in Britain are low.

Chernobyl nuclear plant USSR. Reactors exploded last week causing massive amounts of radiation to escape

EVERY DOT ON THE MAP SHOWS A NUCLEAR PLANT

THE NUCLEAR AGE

"jacket" round its nuclear power stations. It decided to save money and not to do it.

The West German jacket, for example, is so tough that a jumbo jet could crash full on it without smashing it.

Could Chernobyl happen here — at Dounreay, or say, Dungeness?

Yes, it could, and there's no sense in ducking the fact. It is a remote, theoretical, almost impossible possibility.

Everything went wrong at Chernobyl.

Control

It was the wrong system in the wrong place operated by the wrong Government.

The Russians took a chance and the chance didn't come off.

Nuclear power can keep the world warm — or it can incinerate it. It must be caged. It must be kept under control.

The price of its energy is eternal vigilance.

SO FAR, WE HAVEN'T HAD IT.

THIS is the world of nuclear power. According to the latest official figures Britain has 38 reactors, the United States 93 and disaster-struck USSR 51.

The map shows that the bulk of nuclear energy plants are in Europe, USA and Russia. There are very few in the Third World and none in Australia.

Europe, USA and Russia have all had accidents — at Windscale (now Sellafield) in 1957, at America's Three Mile Island in 1979 and now at Chernobyl.

In Britain we rely on gas-cooled reactors. But the Central Electricity Board wants to build a water-cooled model at Sizewell.

The ill-fated Chernobyl reactor was water-cooled.

Planners say the British one will be safer.

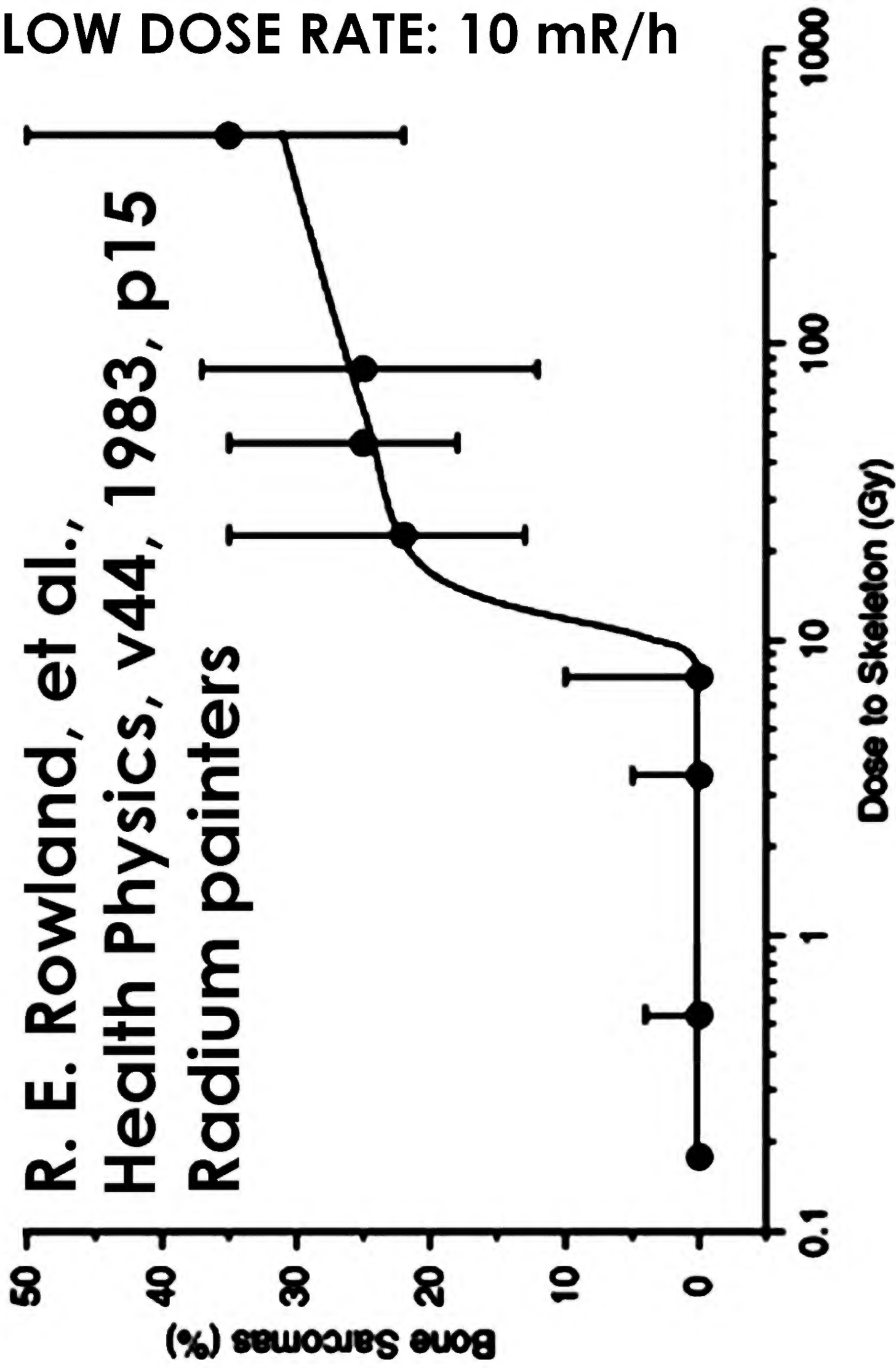


Drawing by DON ROBERTS

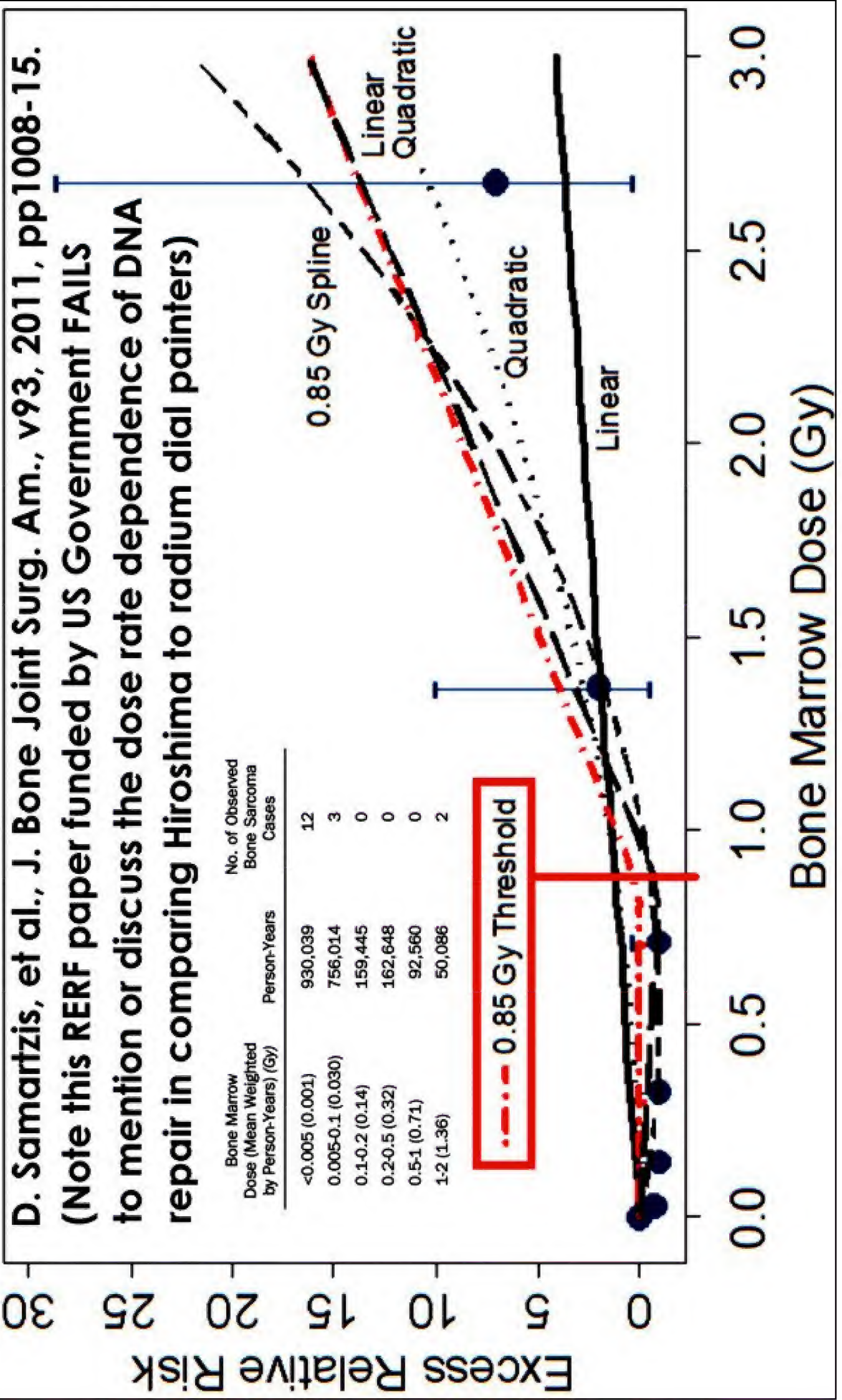
Lying DAILY MIRROR anti-nuclear radiation propaganda after Chernobyl led to 100,000 unnecessary abortions in Europe

LOW DOSE RATE: 10 mR/h

**R. E. Rowland, et al.,
Health Physics, v44, 1983, p15
Radium painters**



Threshold dose and hormesis evidence for bone cancer in Hiroshima and Nagasaki (very HIGH DOSE RATE)



Radium in Humans

A Review of U.S. Studies

by
R.E. Rowland
Environmental Research Division

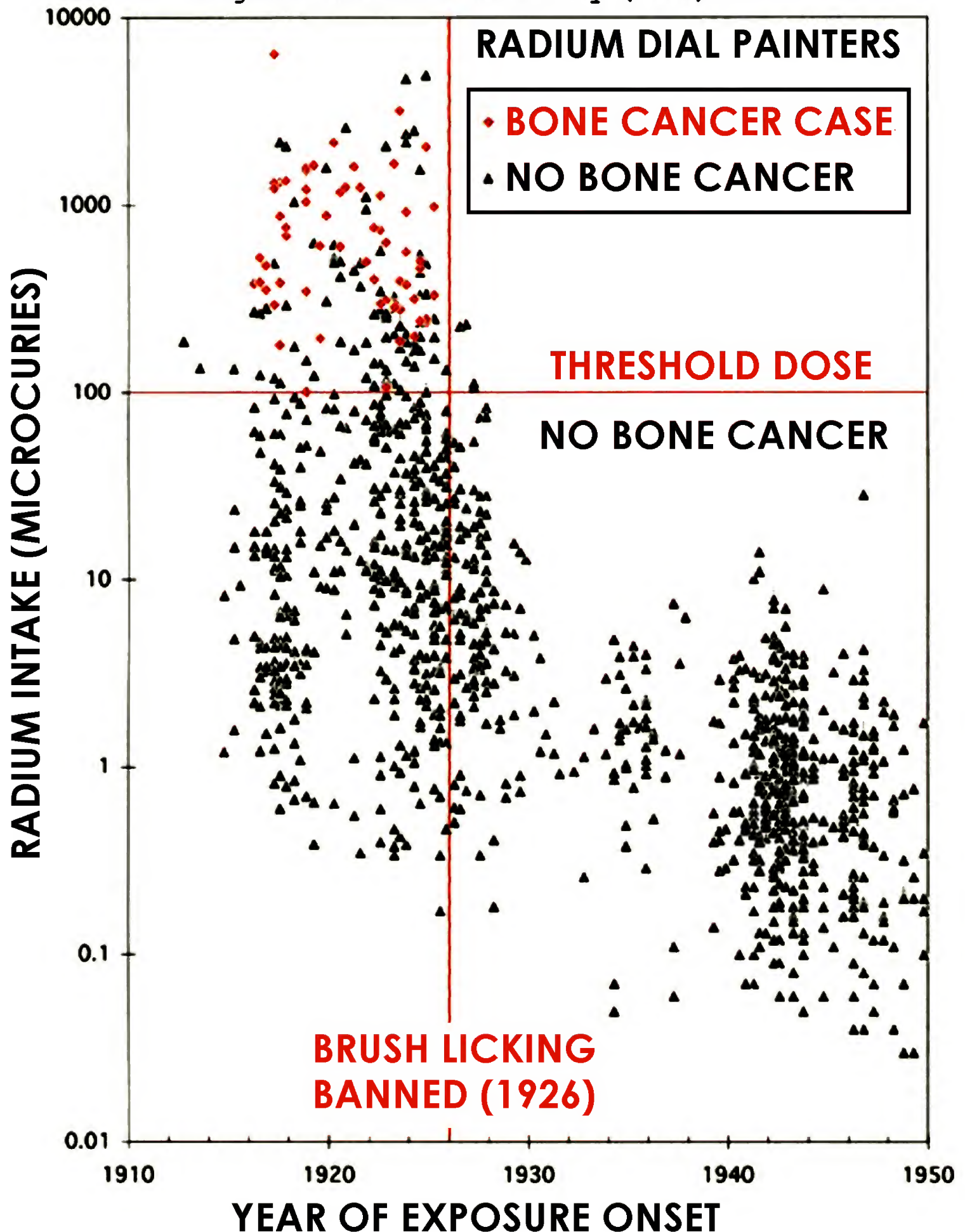


Argonne National Laboratory
9700 South Cass Avenue
Argonne, Illinois 60439

September 1994

Work supported by the United States Department of Energy,
Office of Energy Research, Office of Health and Environmental Research,
and Assistant Secretary for Environment, Safety, and Health,
Office of Epidemiology and Health Surveillance

Rowland, R. E. Radium in Humans: A Review of U. S. Studies, Argonne National Laboratory (1994).

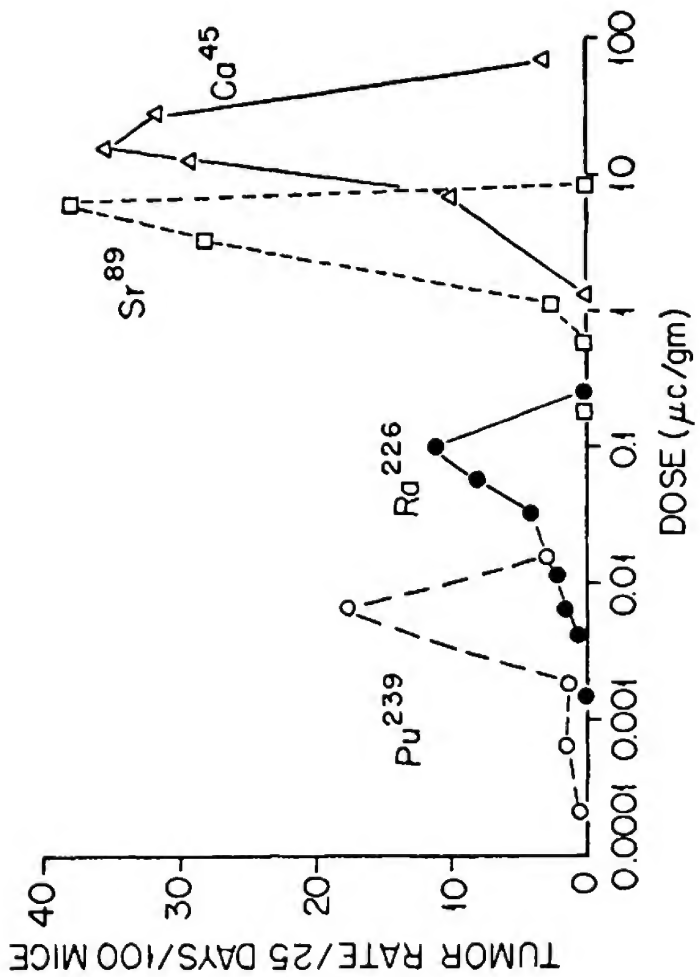


The concept that radiation should have its own exposure standards grew from early radiobiological effects on humans working with the new radiation energy sources. The first official exposure standard for a radionuclide in the body was established for ^{226}Ra at a level of $0.1\text{ }\mu\text{Ci}$, by a task group assembled by the U.S. National Bureau of Standards in 1941. On the basis of the average radiation dose to the skeleton from deposited radium, a “practical threshold” dose of 10 Gy was established many decades ago by the pioneer of the work contained in this book, Dr. Robley Evans, then at the Massachusetts Institute of Technology. It was Evans who, through appearances before the Atomic Energy Commission and congressional committees, spearheaded the establishment of the Center for Human Radiobiology at Argonne National Laboratory in 1968.

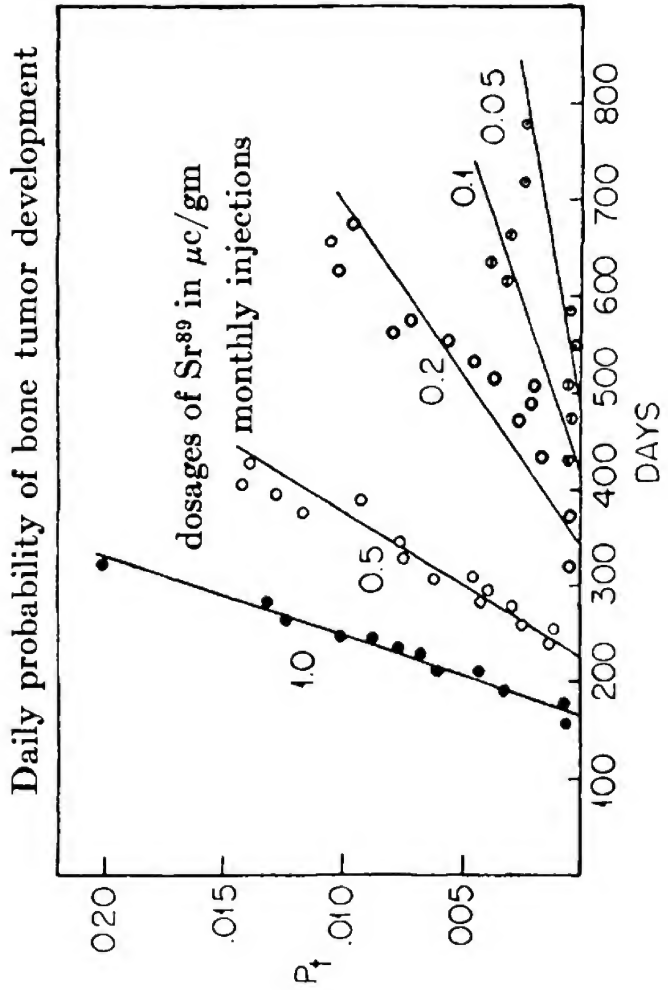
Robert G. Thomas
Program Manager
Environmental Research Division

xī

Threshold dose rate for bone cancer in mice

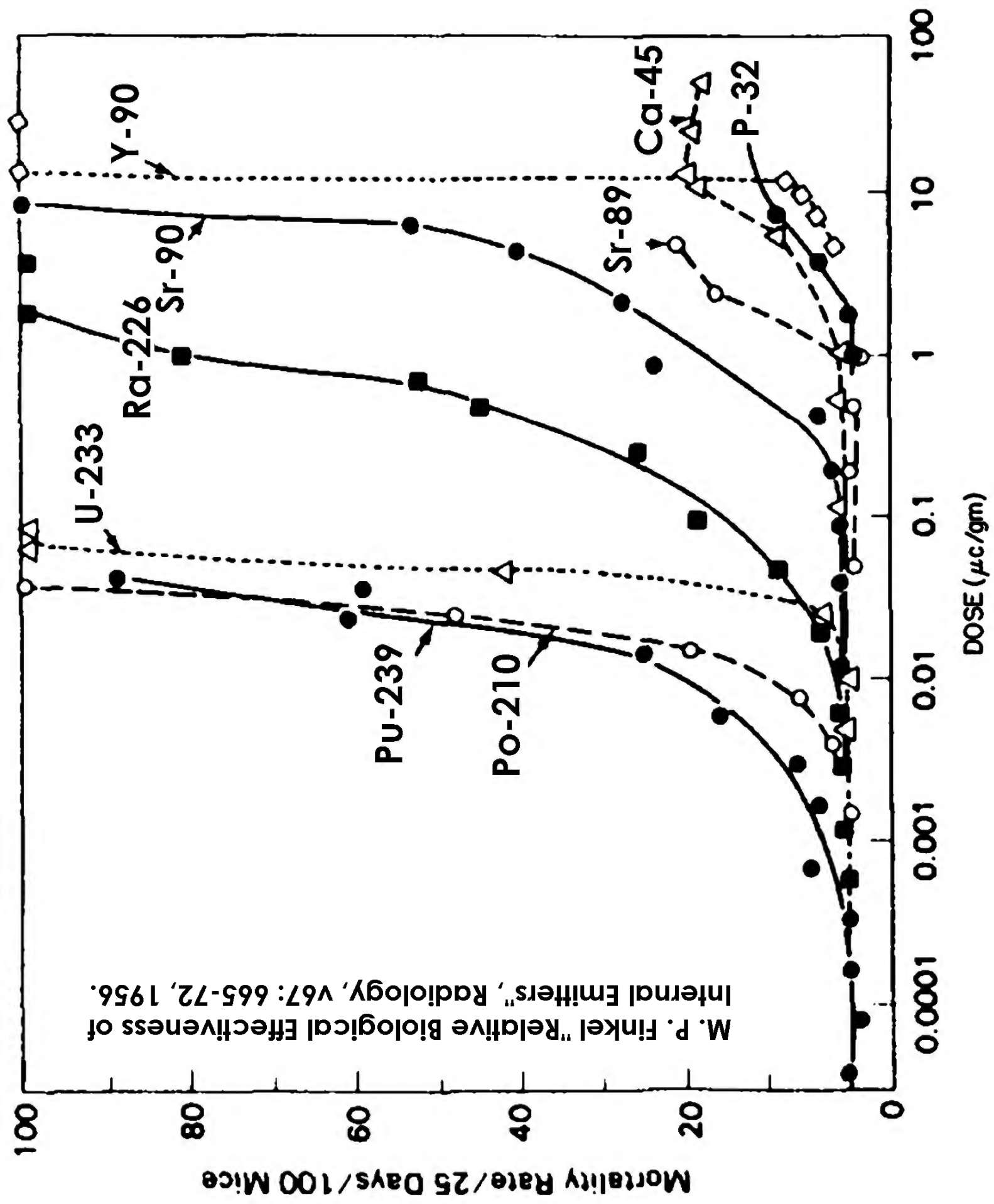


M. P. Finkel "Relative Biological Effectiveness of Internal Emitters", Radiology, v67: 665-72, 1956.



A. M. Brues, "Biological Hazards and Toxicity of Radioactive Isotopes", J. Clin. Investigation, v28, pp. 1286-96, 1949.

M. P. Finkel "Relative Biological Effectiveness of Internal Emitters", Radiology, v67: 665-72, 1956.



M. P. Finkel "Relative Biological Effectiveness of Internal Emitters", Radiology, v67: 665-72, 1956.

Bone Malignancies Rate/25 Days/100 Mice

DOSE ($\mu\text{c/gm}$)

Sr-90

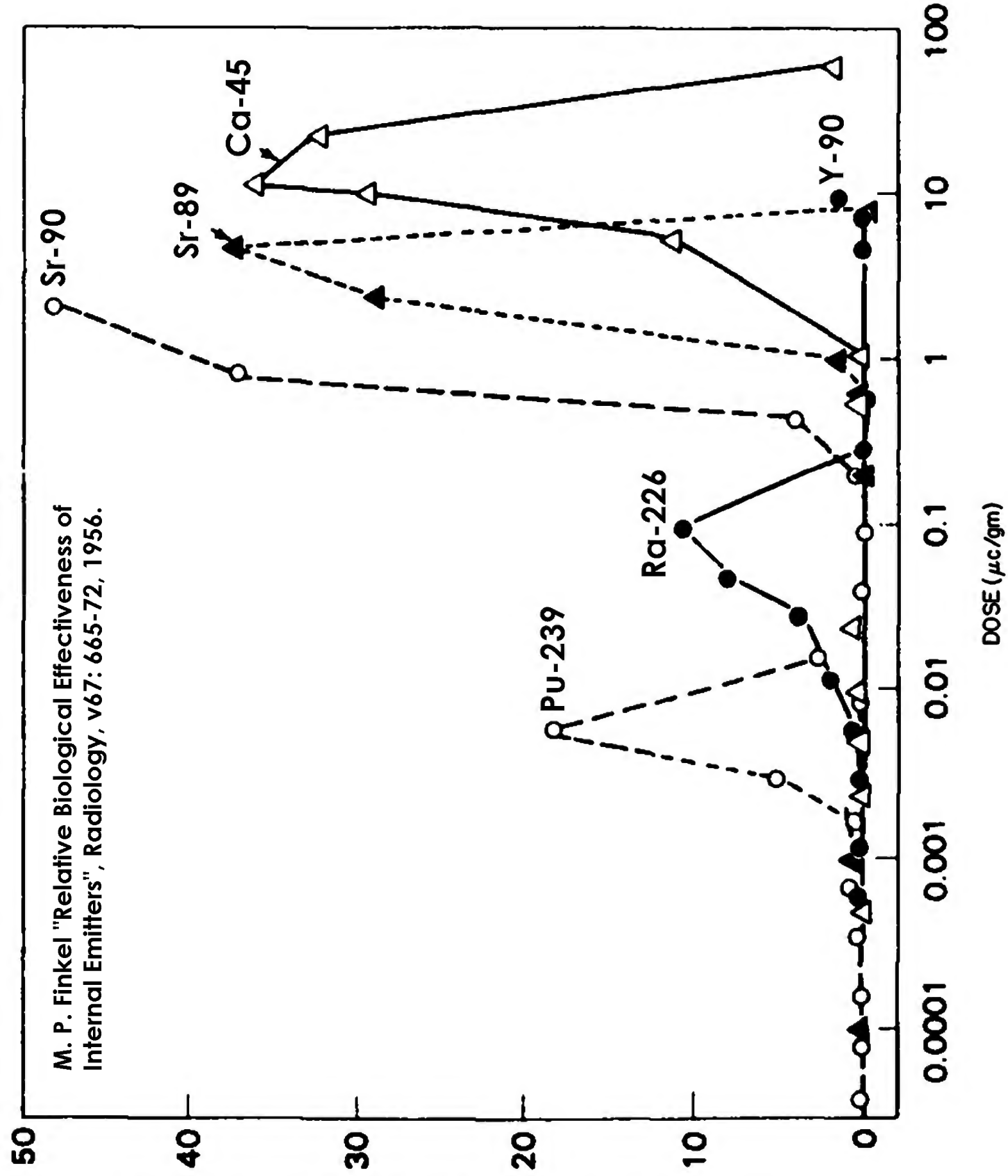
Sr-89

Ca-45

Ra-226

Pu-239

Y-90



Inactive p53

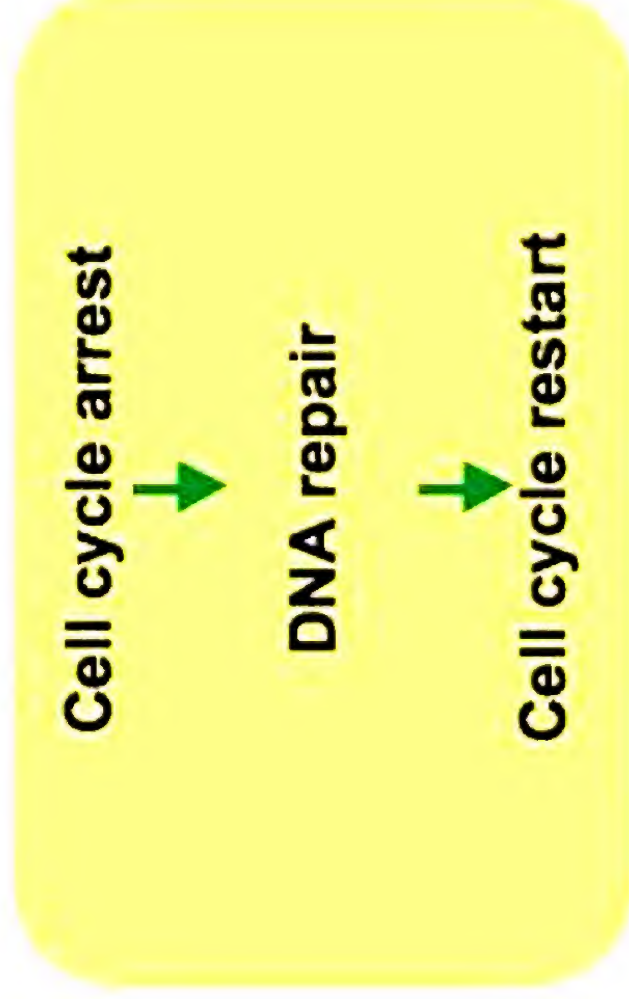
Active p53

radiation

mdm2

p53

p53



Prevention of cancer or genetic defect

Inactive P53 (bound to mdm2)



DNA damage

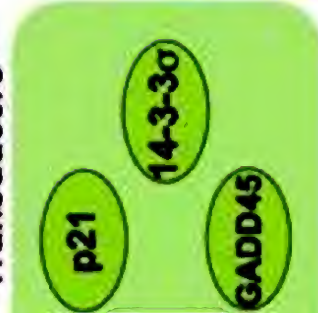
Stress ↓
mediators **ATM** **CHK2**



Active p53



Transducers



Cell cycle arrest



DNA repair



Cell cycle restart



Apoptosis

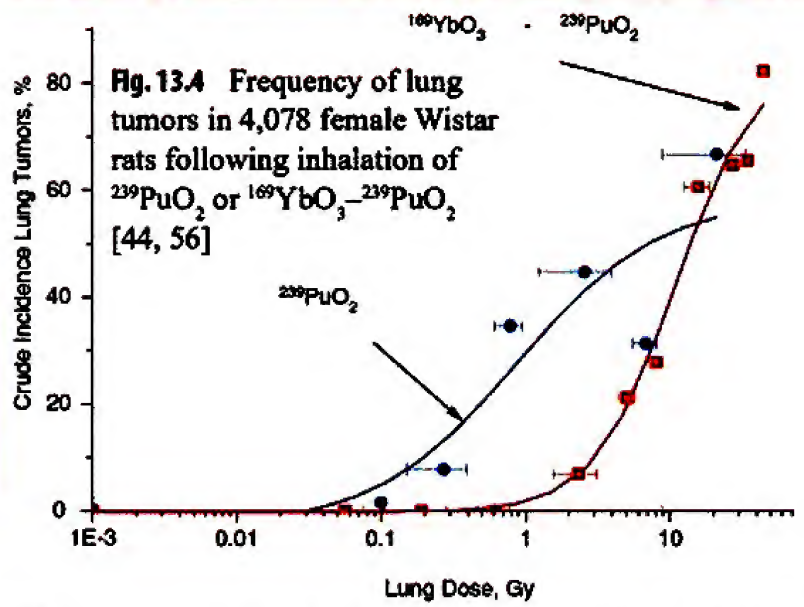
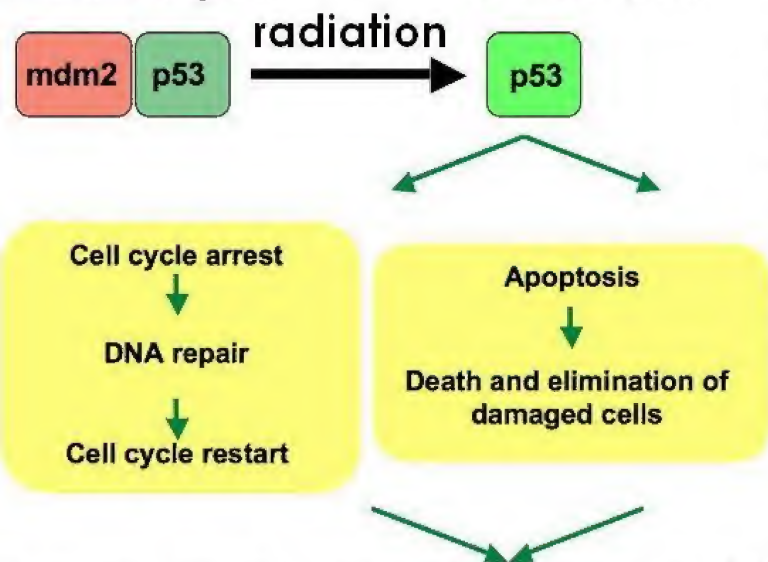


**Death and elimination of
damaged cells**



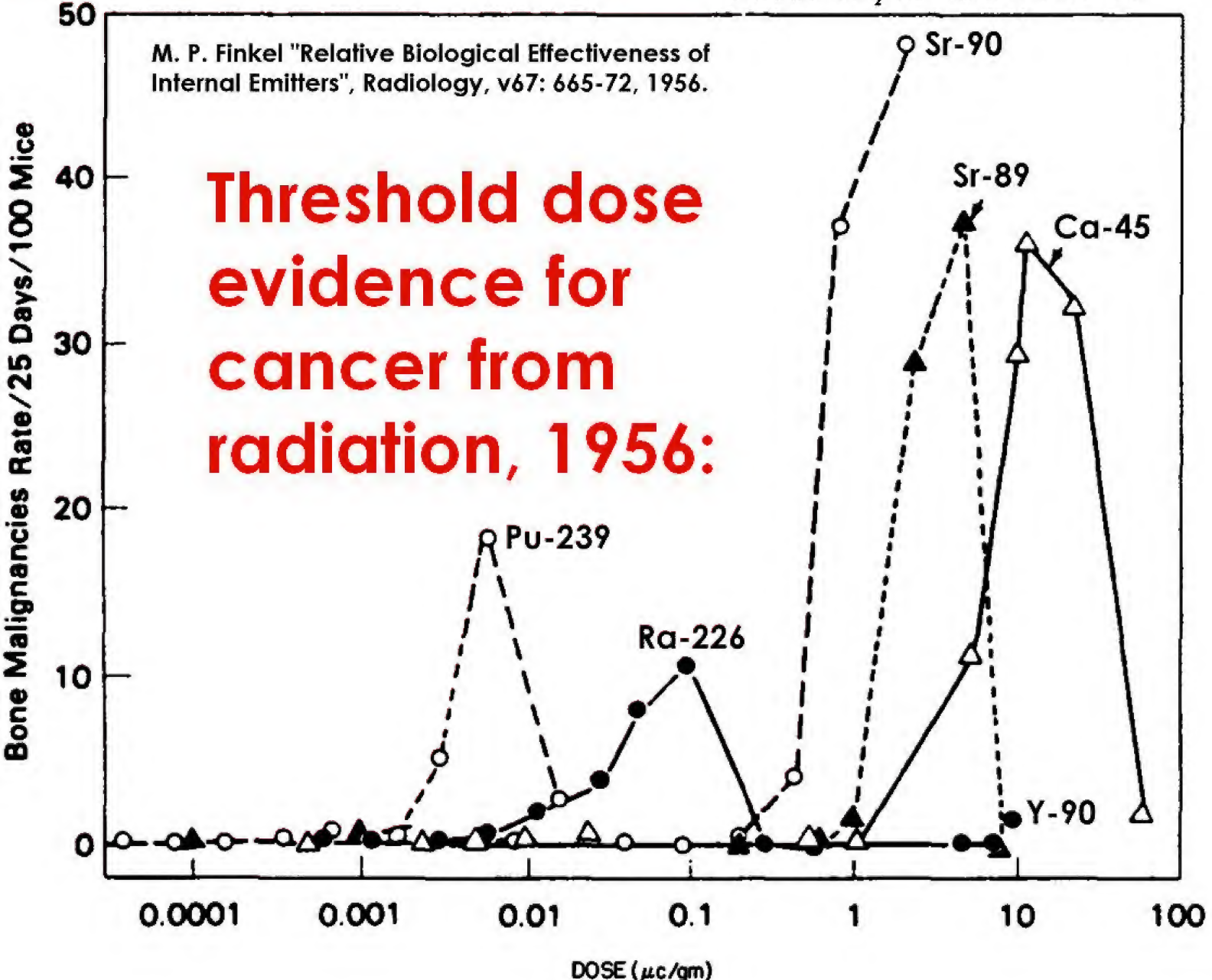
CELLULAR AND GENETIC STABILITY

Inactive p53 Active p53

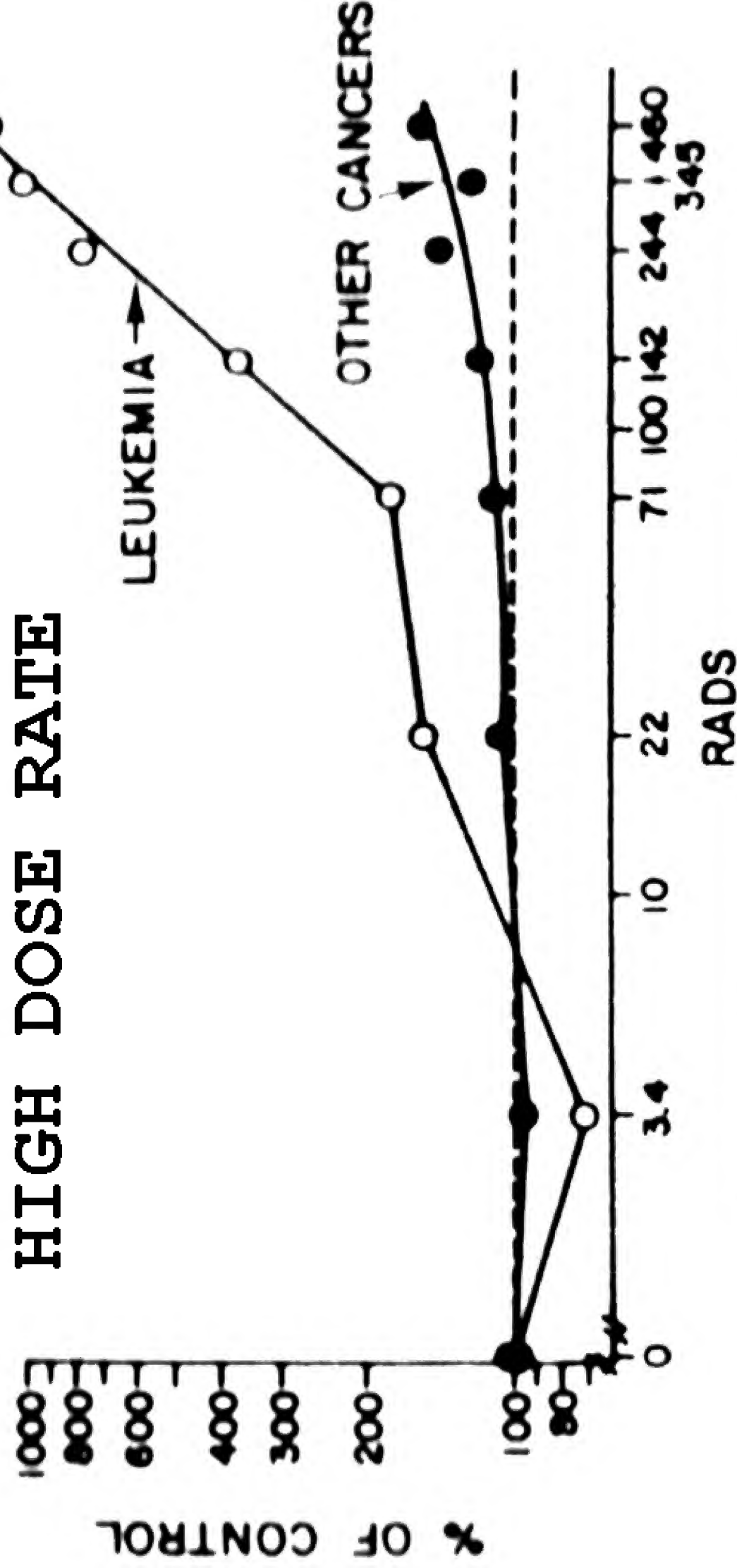


Prevention of cancer or genetic defect at low dose rates (at high dose rates, double strand DNA breaks are too rapid)

- 44. Sanders CL, Lauhala KE, McDonald KE (1993) Lifespan studies in rats exposed to $^{239}\text{PuO}_2$ aerosol. III. Survival and lung tumors. *Int J Radiat Biol* 64:417-340
- 56. Sanders CL, Dagle GE, Cannon WC et al (1976) Inhalation $^{239}\text{PuO}_2$ in rats. *Radiat Res* 68:340-360



1950-78 CANCER MORTALITY IN HIROSHIMA-NAGASAKI Kato + Schull, 1982



31,581 23,073

14,942

4,225

3,128

1,381

1,887

PERSONS

639

Dose range milli-sievert	Number in 1950	Cancer deaths (excl. leukaemia)		Leukaemia deaths	
		total rate	rate from radiation	total rate	rate from radiation
Less than 100	68467	11.2%	0.09%	0.2%	0.01%
100 to 200	5949	12.3%	0.7%	0.2%	-0.01%
200 to 1000	9806	13.2%	1.9%	0.6%	0.3%
More than 1000	1829	24.1%	8.1%	3.5%	2.4%
All	86611	11.7%	0.6%	0.3%	0.1%

Cancer deaths among 86611 Hiroshima and Nagasaki survivors, 1950-2000

The total radiation-related deaths from solid cancer and leukaemia were 480 and 93, respectively.

<http://www.bioone.org/doi/abs/10.1667/RR3232>

Preston, D. L., Pierce, D. A., Shimizu, Y., Cullings, H. M., Fujita, S., Funamoto, S. and Kodama, K., "Effect of Recent Changes in Atomic Bomb Survivor Dosimetry on Cancer Mortality Risk Estimates," Radiat. Res. v162, pp377–389 (2004).

Source: Dr Wade Allison
1 milliSievert = 100 mR

REVISED - "PLANET OF THE APES" - 5/23/67

ZAIUS

I've seen some of your fossils and artifacts. They're worthless.

TAYLOR

(derisively)

And that's your Minister of Science. Honor-bound to expand the frontiers of knowledge.

Except that he's also the Chief Defender of the Faith.

Radiation Hormesis and the Linear-No-Threshold Assumption

Charles L. Sanders

THE NATURE OF RADIOACTIVE FALL- OUT AND ITS EFFECTS ON MAN

HEARINGS BEFORE THE SPECIAL SUBCOMMITTEE ON RADIATION OF THE JOINT COMMITTEE ON ATOMIC ENERGY CONGRESS OF THE UNITED STATES EIGHTY-FIFTH CONGRESS FIRST SESSION ON THE NATURE OF RADIOACTIVE FALLOUT AND ITS EFFECTS ON MAN

MAY 27, 28, 29, AND JUNE 3, 1957

PART 1

Printed for the use of the Joint Committee on Atomic Energy



UNITED STATES
GOVERNMENT PRINTING OFFICE

Representative VAN ZANDT. Dr. Muller, in the December 3, 1956, issue of the Federation of American Scientists you are quoted as saying this:

It is reckless to increase the risk of war by continuing H-bomb tests. It is not the fallout from these tests that is at issue at this time but the war feeling. The first step for peace open to us is a discontinuance of tests by both sides. If breached by either side it can be detected by the other.

STATEMENT OF DR. W. L. RUSSELL, OAK RIDGE NATIONAL LABORATORY ⁵

Dr. RUSSELL. Mr. Chairman, members, the testimony to be given here is presented in response to one of the requests by this committee for scientific results on the biological effects of radiation caused by events other than fallout. Assuming the present estimates of radiation from fallout to be approximately correct, it would in fact be virtually impossible at the present time to measure the genetic effects of fallout in mammals. In estimating the genetic hazards of fallout, we are, therefore, forced into using the information obtained from experiments, such as those to be described, in which much higher levels of radiation were used.

⁵B. A., Oxford University, 1932; Sherman Pratt fellow, Amherst College, 1932-33; fellow, University of Chicago, 1933-34; assistant, department of zoology, University of Chicago, 1934-36; Ph. D., University of Chicago, 1937; research associate, Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine, 1937-47; principal geneticist, Oak Ridge National Laboratory, 1947 to present; research and publications on the genetic effects of radiation in mice. In charge of the Mammalian Genetics and Development Section of the Biology Division of Oak Ridge National Laboratory. Member of the United States delegation to the 1955 Geneva Conference on the Peaceful Uses of Atomic Energy. Member of the Committee on Genetics Effects of Atomic Radiation, National Academy of Sciences. (Submitted by witness.)

RADIOACTIVE FALLOUT AND ITS EFFECTS ON MAN 1087

Our present information on this point indicates that mouse genes are on the average approximately 15 times as sensitive to radiation as *Drosophila* genes. The earlier estimates of genetic hazards in man based on results in *Drosophila* have, therefore, been revised.

Another question on which information was badly needed was whether or not there is any recovery from genetic damage with time after irradiation. Some geneticists believed that there would be no such recovery. Others thought that some recovery might occur. Critical evidence on this point had not been obtained. Most of the information along these lines came from experiments with *Drosophila* sperm, whereas the evidence needed was for immature sex cells. Let me elaborate for a moment on the importance of the cell stage, i. e., immature versus mature germ cells, before we continue with the question of recovery.

1088 RADIOACTIVE FALLOUT AND ITS EFFECTS ON MAN

Representative HOLIFIELD. At that point, Dr. Russell, could you tell this committee how near you think the experiments on mice would correspond to the radiation of human beings? You have made the statement that the mouse is 15 times more sensitive than the fruitfly. Can you give us a comparison between the mice and the human being?

ERROR BY RUSSELL: IGNORING DOSE RATE!

Dr. RUSSELL. This is all on mice.

I might also interject at this point another comment. A good deal has been said about there being no *Drosophila* data on mutation rates below 25 roentgens and about there being no mouse data below 300 roentgens. Yet, again referring to Dr. Oakberg's work in our laboratory, he can see ~~and actually measure~~ the killing of spermatogonial cells with doses as low as 2 or 3 roentgens, and even with 1 rep of neutrons. A dose of 22 roentgens kills half of the sensitive spermatogonia. So it seems to me that if we can actually see cells that have been killed by doses as low as 2 or 3 roentgens, and can put this on a quantitative basis, if cells are actually killed at these dose levels, there is no question in my mind that there will be genetic effects from doses as low as this.

Representative HOLIFIELD. This has a tremendous impact on the theory of threshold, does it not?

Dr. RUSSELL. It certainly helps to answer the question of threshold for genetic effects. Of course, the question of threshold for some somatic effects is not answered by this, because killed cells might be replaced by normal cells. So it does not conclusively prove anything about the question of a threshold for somatic effects. I think it supports the already quite well established point of there being no threshold for genetic effects, because here is direct experimental evidence on mammals that cells can be killed measurably by doses as low as 2 or 3 roentgens. **RUSSELL LATER FOUND DOSE RATE EFFECTS**

JOINT COMMITTEE ON ATOMIC ENERGY

SUMMARY-ANALYSIS OF HEARINGS
MAY 27-29, AND JUNE 3-7, 1957

ON

THE NATURE OF RADIOACTIVE FALLOUT
AND ITS EFFECTS ON MAN



AUGUST 1957

Printed for the use of the Joint Committee on Atomic Energy

UNITED STATES
GOVERNMENT PRINTING OFFICE

GROUP THINK CONSENSUS IS NOT SCIENTIFIC FACT; DNA REPAIR IS IGNORED:

3. *Biological effects of radiation.*—There was general agreement that any amount of radiation, no matter how small the dose, increases the rate of genetic mutation (change) in a population. There was, on the other hand, a difference of opinion as to whether a very small dose of radiation would produce, similarly, an increased incidence of such somatic (nongenetic) conditions as leukemia or bone cancer, or a decrease in life expectancy, in a population.

4. *Tolerance limits.*—There was general agreement that there is a limit to the amount of radioactivity and, hence, to the amount of fission products that man can tolerate in his environment. The extent to which existing and future generations will be affected by manmade radiation was shown to be intimately tied to certain decisions, moral as well as scientific, that must be made as to how much radiation can be tolerated by the peoples of the world.

5. *Effects of past tests.*—It was clearly shown that man's exposure to fallout radiation including strontium 90 is and will be in general small, *for the testing already done*, compared with his exposure to other, "normal background" sources of radiation (a fraction of 1 to 10 per cent), and even compared with variations in "normal background" sources. But it was not agreed on how this information should be interpreted.

SCIENCE FACTS ARE DETERMINED BY EXPERIMENT, NOT CONSENSUS

There were two bases given for saying that the increase of the incidence in genetic effects of radiation is proportional to dose. The first uses experimental data. All of these data is obtained at doses considerably above background levels. The second is theoretical and holds that the mechanism of genetic damage is damage to the genetic material of each individual cell. The idea of a direct proportion between increase in incidence of genetic effects and dose appears to be accepted widely among scientists. Furthermore, geneticists believe that the direct proportion applies down to zero dose—that is, that there exists no safe “threshold” below which the dose produces no damage, and that damage occurs from any irradiation of the genetic cells, no matter how small the dose. *FALSE! IGNORES DNA REPAIR*

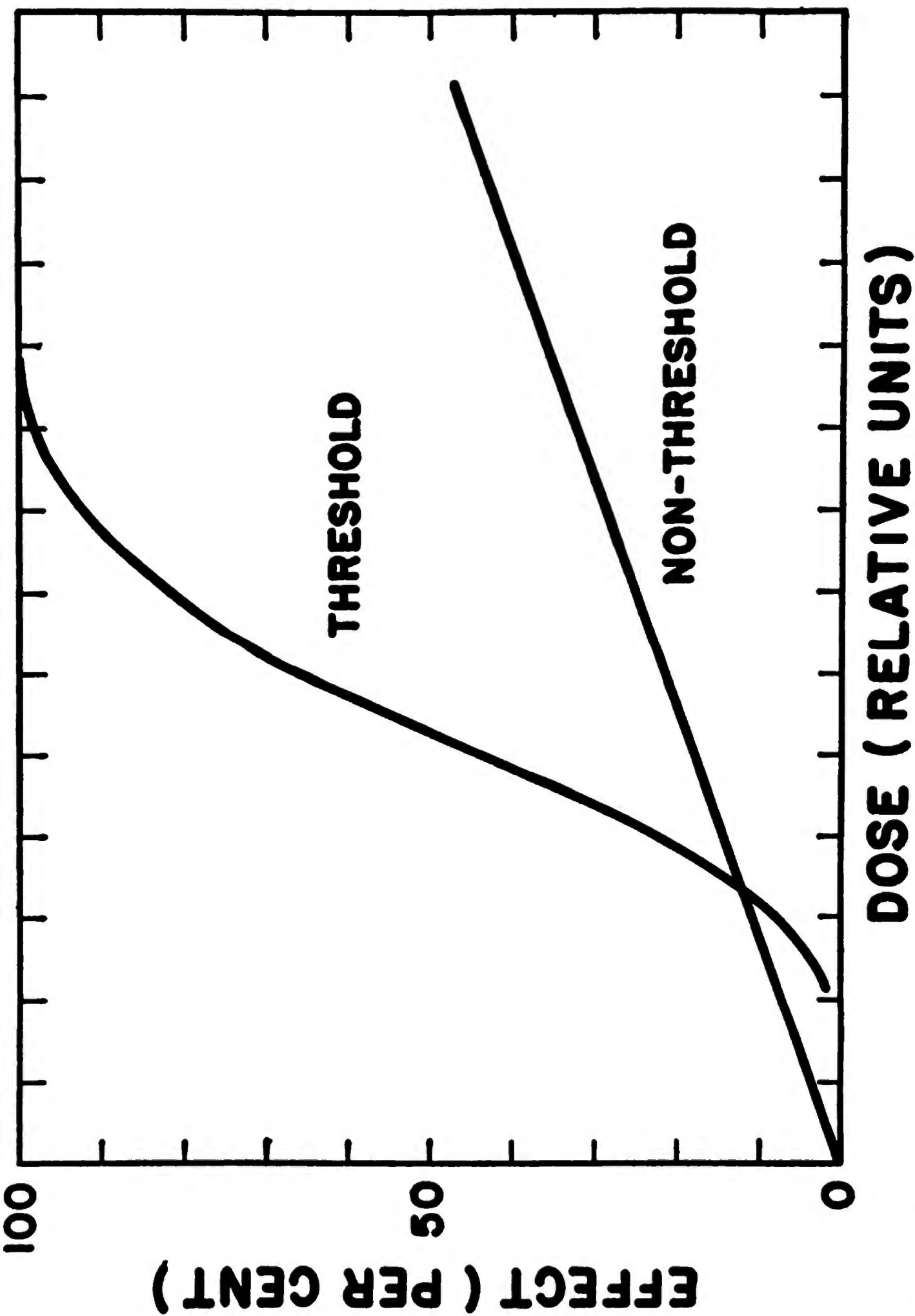


FIGURE 3.—A pictorial representation of the difference between a threshold and a nonthreshold situation. Dose increases to the right. Note that the non-threshold line is a straight line; it needn't be. (See p. 15.) [Figure reprinted from testimony of Drs. Langham and Anderson, Los Alamos Scientific Laboratory.]

Radiation genetics surprise

IT has long been one of the basic axioms of radiation genetics that the genetic mutation rate due to radiation is independent of the radiation intensity, or dose-rate, and depends only on the total integrated dose.

Recent experiments reported by Russell *et al.* (*Science*, 128, 1546) have shown that most of the difference in the observed mutation rates is indeed due to variation in the radiation intensity.

If the dose rate is significant for humans, then the genetic effect of the natural background of radiation will be much less important than that due to medical X-rays.

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The coming of reversibility: The discovery of DNA repair between the atomic age and the information age

Doogab Yi

**Historical Studies in the Physical and Biological Sciences
Vol. 37, No. supplement (Supplement (2007)), pp. 35-72**

ON DECEMBER 18, 1956, Prescott Bush, U.S. Senator from Connecticut, had a conversation with the members of the Department of Biophysics at Yale University, in which he asked about the radiation hazards of nuclear weapons testing. The following month, the Yale biophysicists sent a formal reply to the Senator, expressing their reservations concerning the tests.¹ Their opposition stemmed from their understanding of the biological effects of radiation: First of all, they pointed out that genetic damages inflicted by radiation were “not reversible”; second, current knowledge about the effects

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I thank Angela Creager and Michael Gordin for their guidance, help, and insightful comments on earlier versions of my research paper for their course “Radioactive Sciences.” A graduate seminar on “Computers and Organisms” offered by Angela Creager and Michael Mahoney pointed me to the traffic between computer science and biology. I appreciate the generosity and helpful suggestions of Richard Setlow, Harold Morowitz, and William Summers, especially their first-hand recollections and suggestions for my research. Those in attendance at the presentation of this paper at the annual meeting of the History of Science Society in 2005, especially Jacob Hamblin, Joseph November, and Buhm Soon Park, asked useful questions and offered valuable suggestions for its revision. I thank Dan Bouk for his editorial help, and I especially appreciate useful suggestions from *HSPS* referees. Research for this project was assisted by a grant-in-aid from the Center for the History of Physics at the American Institute of Physics. I remain responsible for any errors in this paper.

The following abbreviations are used: AEC, United States Atomic Energy Commission; *JHB*, *Journal of the history of biology*; NARA, National Archives and Records Administration in Washington, D.C. and College Park, MD; NBL/AIP, Niels Bohr Library at the American Institute of Physics; NBS, National Bureau of Standards; NIH, National Institutes of Health; and ORNL, Oak Ridge National Laboratory, College Park, MD; *PNAS*, National Academy of Sciences, *Proceedings*.

1. Ernest C. Pollard, Richard B. Setlow, Franklin Hutchinson, Walter R. Guild, and Harold J. Morowitz to Senator Prescott Bush, 21 Jan 1957, folder, Medicine, Health, and Safety, Box 47, Record Group 362, NARA.

DNA REPAIR

BY PAUL HOWARD-FLANDERS

*Department of Molecular Biophysics and Radiobiology Laboratories,
Yale University, New Haven, Connecticut*

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INTRODUCTION

Cells from various organisms contain enzyme systems for joining DNA chains and maintaining the integrity and high molecular weight of cellular

SKIN CANCER RESULTS FROM HIGH DOSE RATE



Basal
(rounded
lump with
unhealed
sore)



Squamous Melanoma
(crusty with
inflamed
base) (irregular
shaped dark
mole)



Lifetime risk of skin cancer:

4%

1%

0.8%

Proportion of skin cancer:

68%

18%

14%

IS THERE A LARGE RISK OF RADIATION? A CRITICAL REVIEW OF PESSIMISTIC CLAIMS*

Adnan Shihab-Eldin**

Visiting Scholar from Kuwait Institute for Scientific Research and Lawrence Berkeley Laboratory, Berkeley, CA 94720 USA

Alexander Shlyakhter and Richard Wilson

Department of Physics, Harvard University, Cambridge, MA 02138 USA

A number of situations where it has been claimed that moderate radiation doses cause leukemia or other cancers are carefully reviewed. We look at cases in the United States and Great Britain. Usually, it can be demonstrated that there is an alternative, more probable, explanation for the effect seen. In several cases, the authors of the papers have fallen into statistical traps. The most frequent is a *posteriori* selection of cohort boundaries in both space and time: a trap illustrated dramatically by Feynman. The next most common trap is to arbitrarily select one out of many ways of looking at the data, against which we were warned by Tippet. Several cohorts are compared with respect to the number of persons at risk, average dose, and the number of cancers expected. Of these, only the cohort of A-bomb survivors in Japan provides evidence of clearly visible excess cancers.

STATISTICAL TRAPS

The late Richard Feynman had a dramatic way of demonstrating that a biased selection of data can invalidate standard statistical tests. Coming into class, he said, "You know, the most amazing thing happened to me tonight. I was coming here, on the way to the lecture, and I came in through the parking lot. And you won't believe what happened. I saw a car with the license plate ARW 3571! Can you imagine? Of all the millions of license plates in the state, what was the chance that I would see that particular one tonight?" (Goodstein 1989).

Ernest Sternglass published a paper (Sternglass 1963) alleging a link between fallout from nuclear bomb tests and the infant mortality rate.

It was tempting at the time for scientists to believe Sternglass' claims without looking carefully at them. By 1963, a majority of scientists had successfully persuaded the major countries of the world to stop testing of nuclear bombs in the atmosphere.

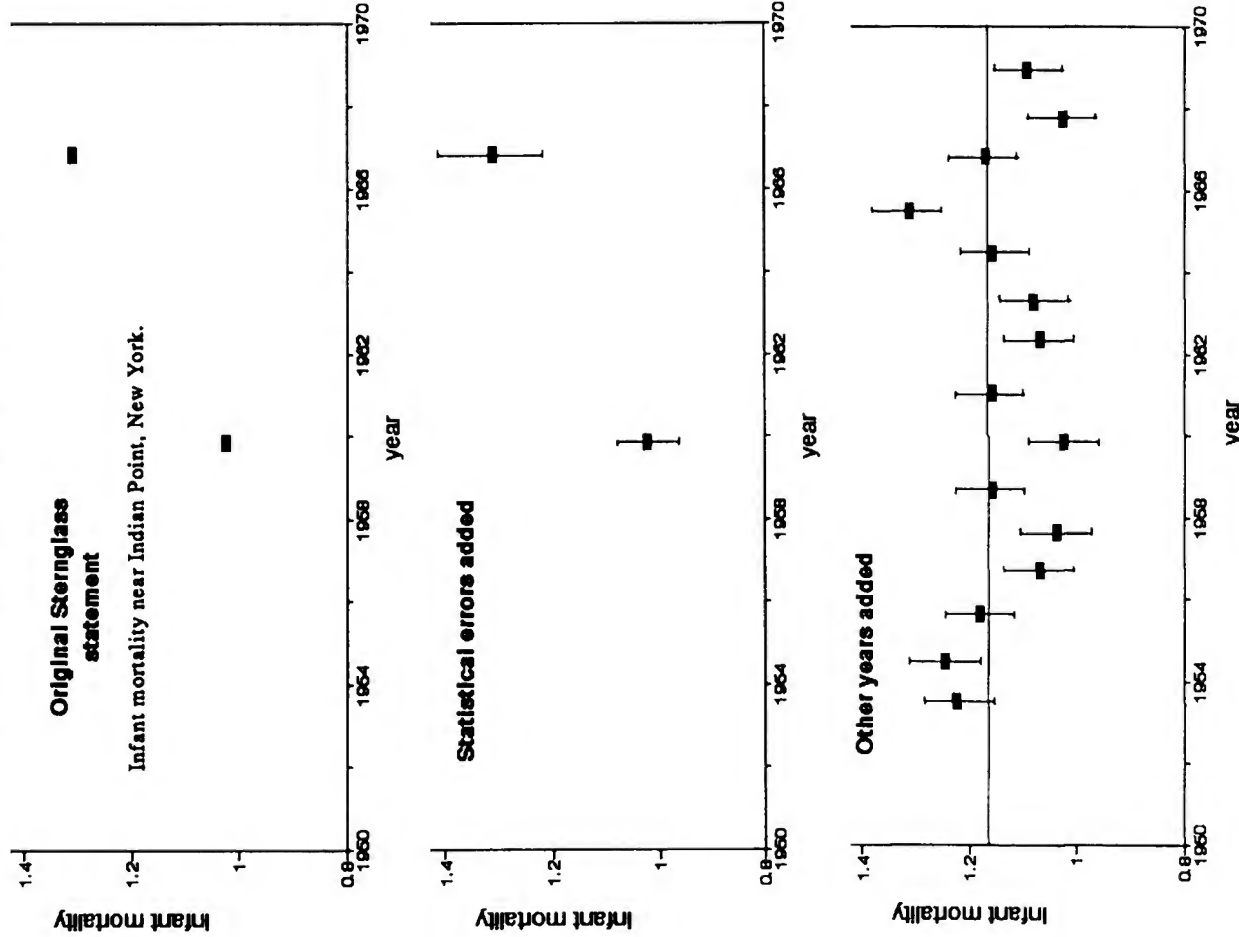
Stewart, A. The pitfalls of extrapolation. New Sci. July 24, 1969.

Tippet, L.H.C. The methods of statistics. An introduction mainly for experimentalists. London: Williams and Norgate, Ltd.; 1937.

Sternglass, E.J. Cancer, relation of prenatal radiation to development of the disease in childhood. Science 140:1102-04; 1963.

Sternglass' claims met with a storm of criticism (Graham and Thro 1969; Boffey 1969; Stewart 1969; Wrenn 1969; Sagan 1969; Eisenbud et al. 1969; Heller 1970).

An example of one of these is his claim that infant mortality increased near Indian Point I Nuclear Power Plant just after it began operation in 1961.



Appearance of *db/db* Mice at 90 Weeks of Age

Irradiated

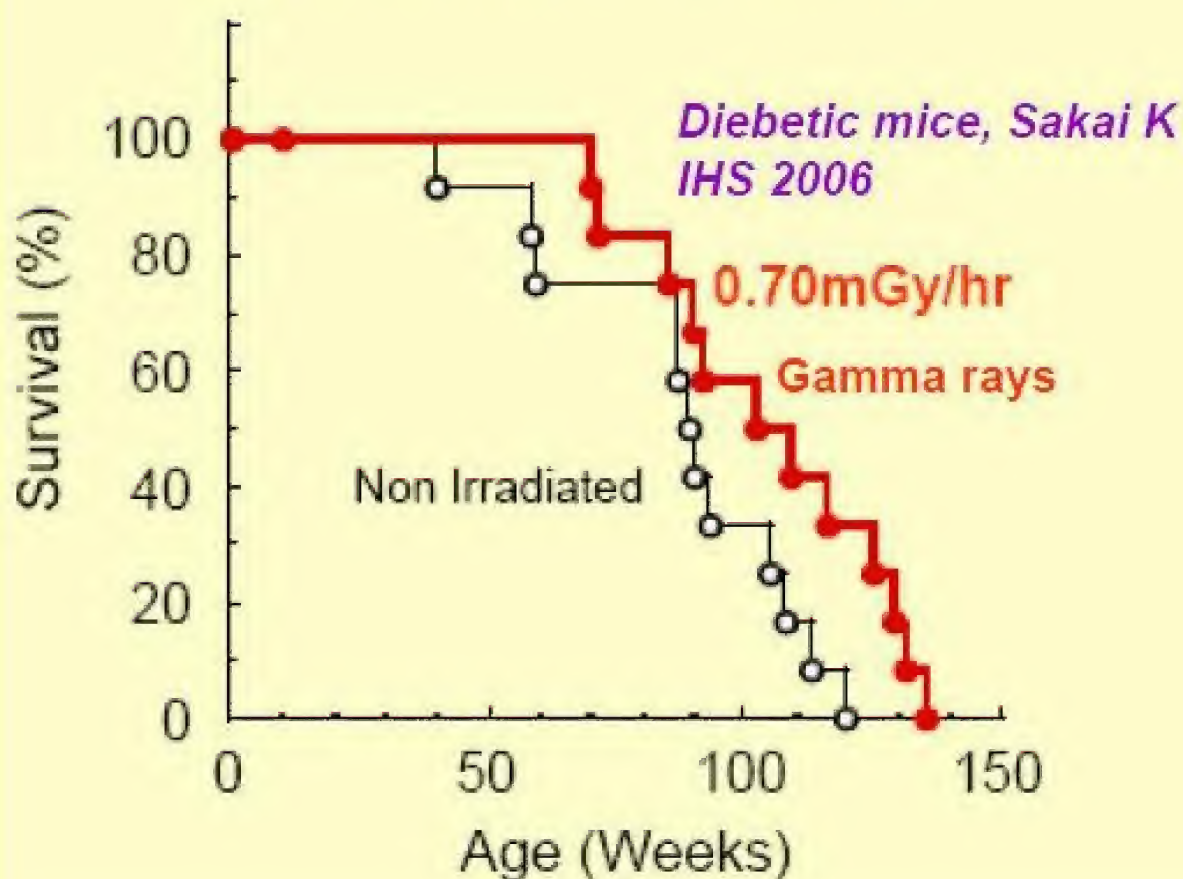


Non-Irradiated



Sakai K, IHS 2006

Prolongation of Life Span of *db/db* Mice by Low Dose Rate Irradiation



"A Tragedy of Misunderstanding: there was no major radiation disaster at Fukushima"

An invited talk at the Annual Meeting of the American Nuclear Society,
Chicago, 25 June 2012

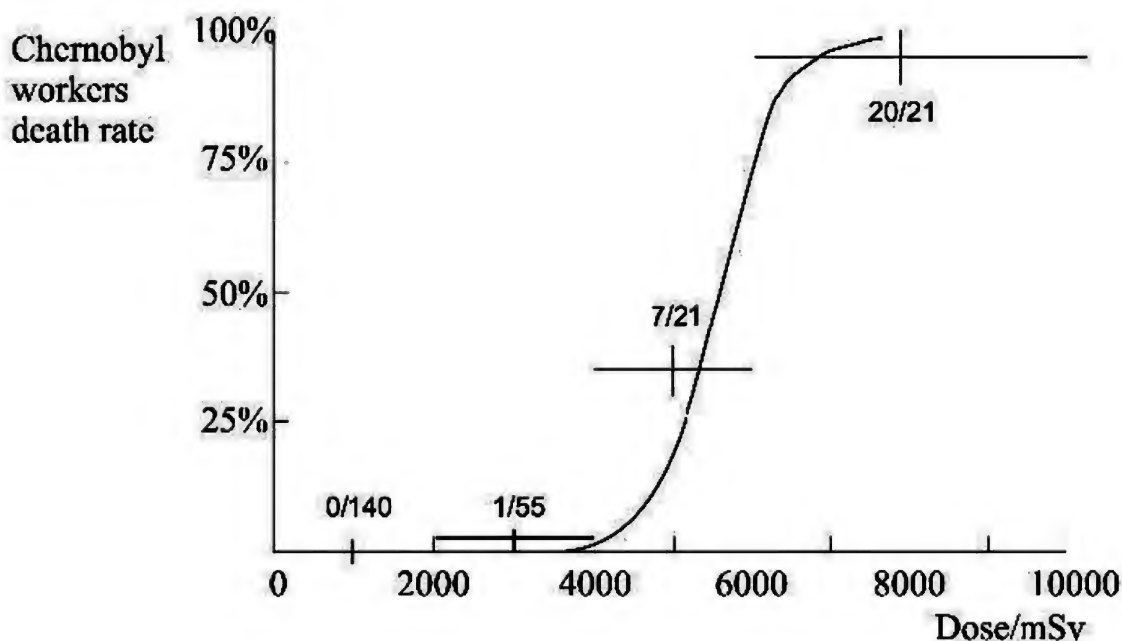
by Wade Allison, Emeritus Professor of Physics at the University of Oxford, UK

Summary

Low or moderate radiation doses are benign but the public health effects of fear and panic, caused by ignorance and over-cautious international "safety" standards, are dangerous, both to individuals and to the society and economy at large. A disaster of fear, not radiation, occurred at Fukushima as a result of the damage to the nuclear plant.

When the earthquake struck there were 500,000 people in the region subsequently inundated by the tsunami and within 26 to 45 minutes, all except 18,880 had managed to escape, a truly remarkable achievement. The training and understanding of the Japanese people that was evident for the tsunami was absent for the release of radiation and radioactivity. Faced by an unknown threat, nobody knew what action to take, and few in authority knew either, so that rumour and panic, extending to the highest levels, lead to serious social harm, widespread voluntary evacuation, failed businesses and losses of confidence in society and nuclear power. This failure of society to cope with an accident, for which no loss of life should be expected, is strange. Fear of powerful energy is a protective animal reaction, but man has survived dangers through study, understanding and mutual organisation -- although not in the case of radiation and radioactivity. Why not?

Cell death from an acute dose. Figure 4 refers to the 237 initial firefighters at Chernobyl who received high doses in a short period. Within a few weeks 28 were dead from ARS. Further deaths since then were probably not related to radiation. The crosses on the figure follow a typical stabilisation curve with a threshold of 2000 to 4000 mSv. The curve shows similar data for laboratory rats.



Survival of Food Crops and Livestock in the Event of Nuclear War

Proceedings of a symposium held at
Brookhaven National Laboratory
Upton, Long Island, New York
September 15–18, 1970

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Editors

David W. Bensen
Office of Civil Defense
Arnold H. Sparrow
Brookhaven National Laboratory

December 1971

THE SIGNIFICANCE OF LONG-LIVED NUCLIDES AFTER A NUCLEAR WAR

R. SCOTT RUSSELL, B. O. BARTLETT, and R. S. BRUCE

Agricultural Research Council, Letcombe Laboratory, Wantage, Berkshire, England

ABSTRACT

The radiation doses from the long-lived nuclides ^{90}Sr and ^{137}Cs , to which the surviving population might be exposed after a nuclear war, are considered using a new evaluation of the transfer of ^{90}Sr into food chains.

As an example, it is estimated that, in an area where the initial deposit of near-in fallout delivered 100 R/hr at 1 hr and there was subsequent worldwide fallout from 5000 Mt of fission, the dose commitment would be about 2 rads to the bone marrow of the population and 1 rad to the whole body. Worldwide fallout would be responsible for the major part of these doses.

It is now widely recognized that long-lived fission products would make a negligible contribution to the radiation exposure of the population in heavily contaminated areas shortly after a nuclear attack. The external radiation dose would usually be dominant, and, if simple precautions were taken to avoid the superficial contamination of foodstuffs, the entry of ^{131}I into milk would cause the only important problem of dietary contamination. Thus, for example, infants probably would not receive doses of more than 0.1 rad to bone marrow from ^{90}Sr nor more than 0.01 rad from ^{137}Cs in the weeks after a nuclear attack if they were fed continuously with milk produced in an area where the external dose rate at 1 hr after detonation had been 100 R/hr. Doses to the thyroid from ^{131}I might, however, exceed 200 rads.

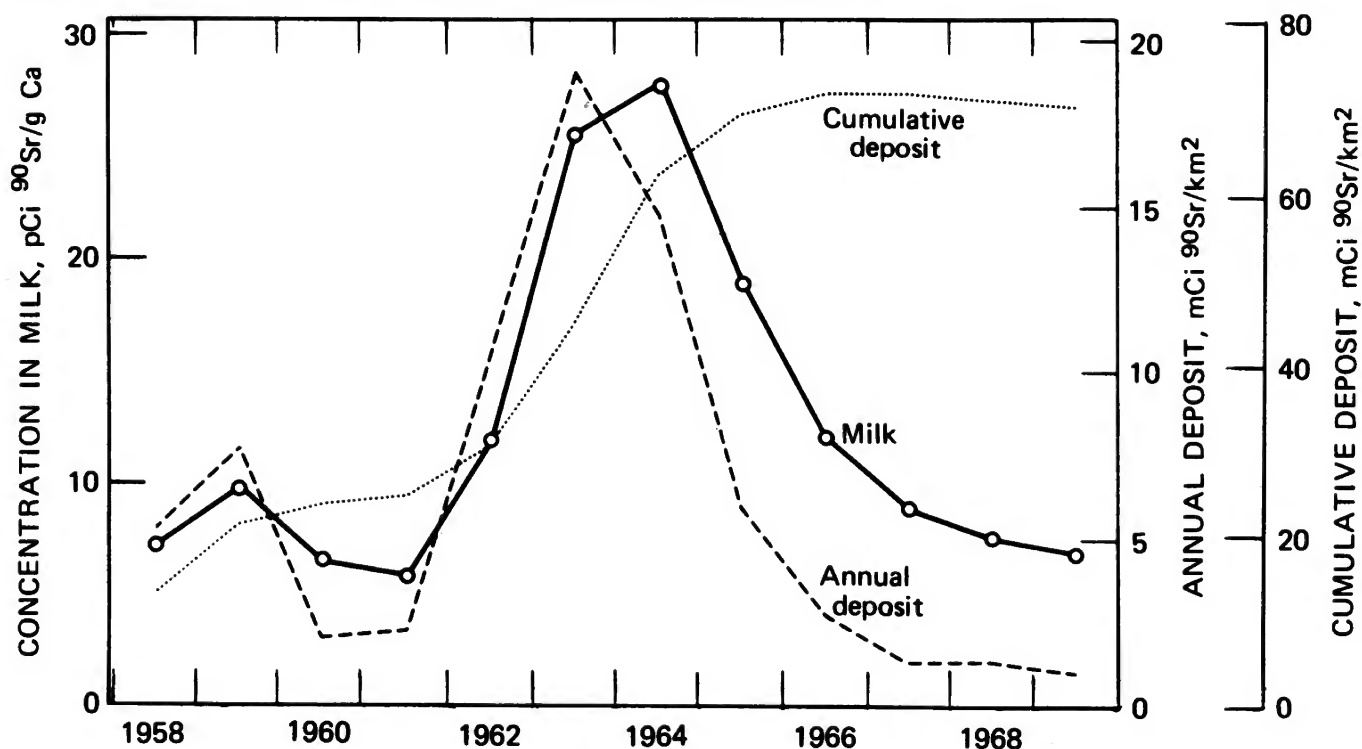
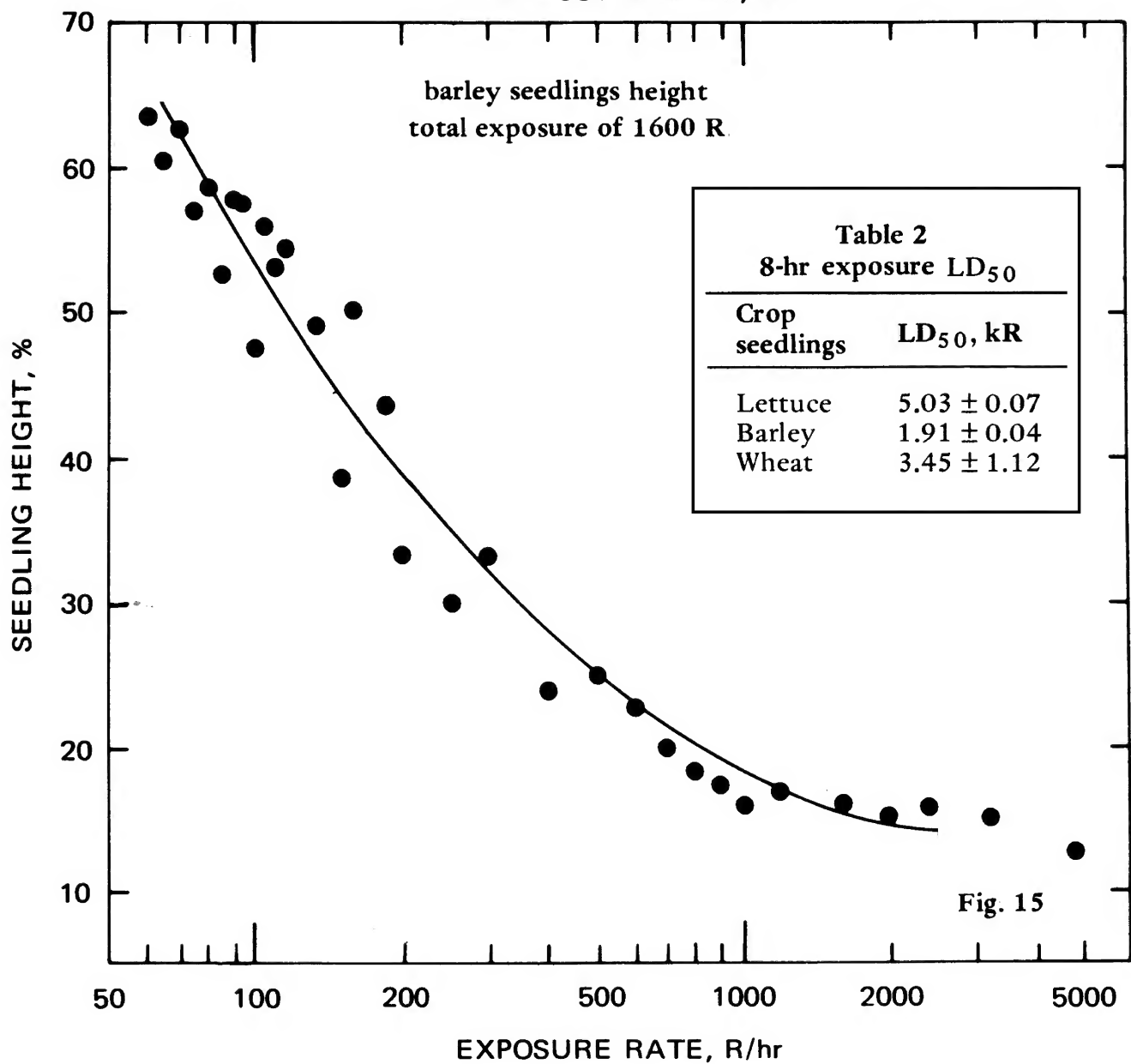
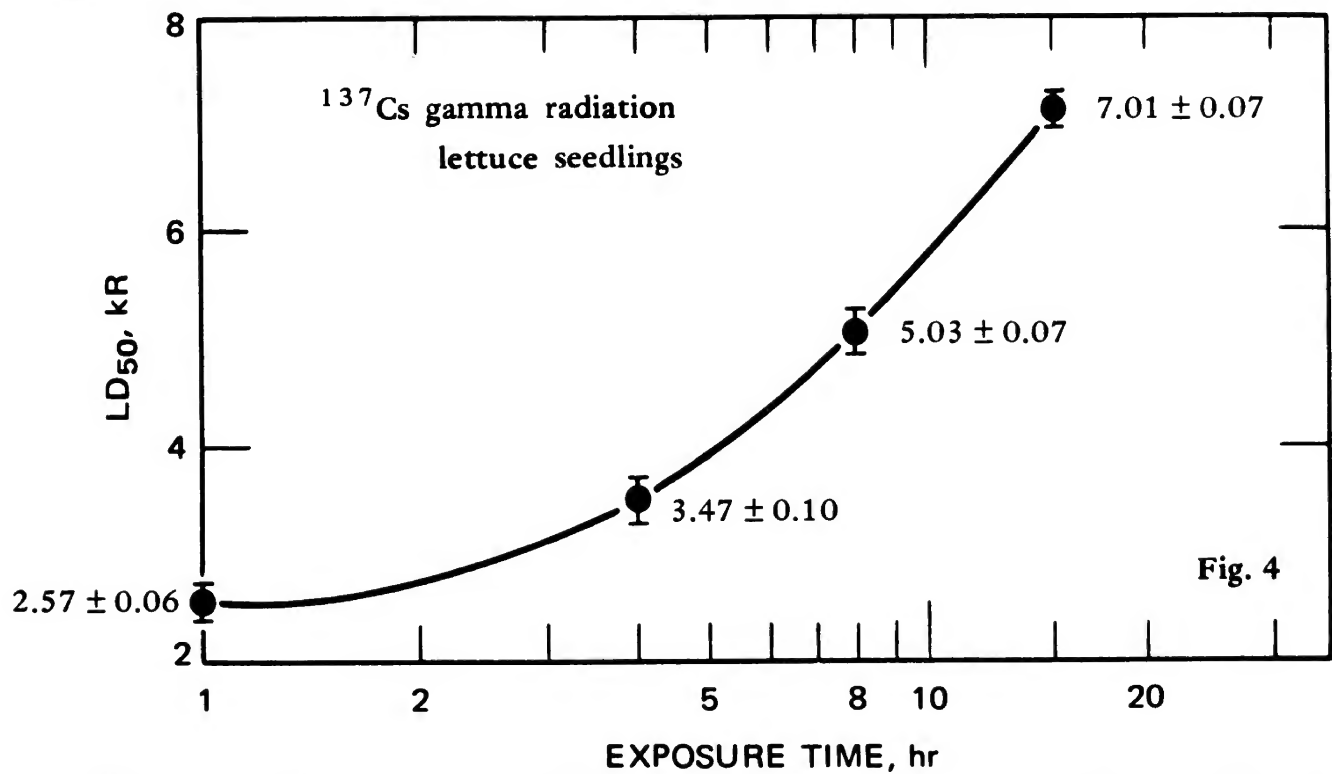


Fig. 1 Strontium-90 in fallout and milk in the United Kingdom, 1958 to 1969.

EFFECTS OF EXPOSURE TIME AND RATE

P. J. BOTTINO and A. H. SPARROW

Brookhaven National Laboratory, Upton, New York





DOSE RATE IN MAMMALIAN RADIATION BIOLOGY

April 29 - May 1, 1968

UT-AEC

Agricultural Research Laboratory
Oak Ridge, Tennessee

United States Atomic Energy Commission

A Relation of Irradiation Dose-Rate Effects

in Mammals and in Mammalian Cells

J. L. Bateman
Medical Research Center
Brookhaven National Laboratory

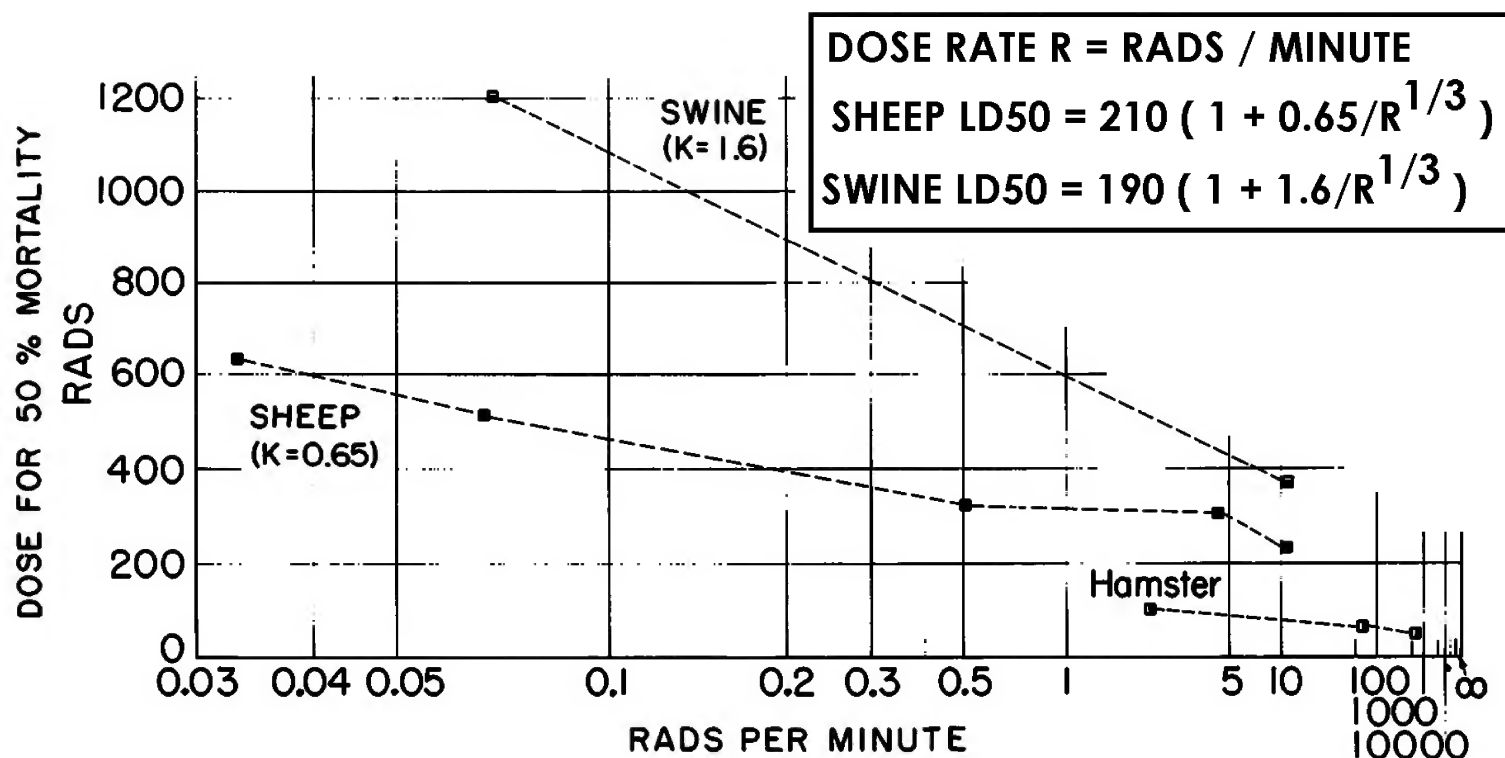


Fig. 1. Experiments in which the LD₅₀ was found to be a linear function of the reciprocal cube root of dose rate.

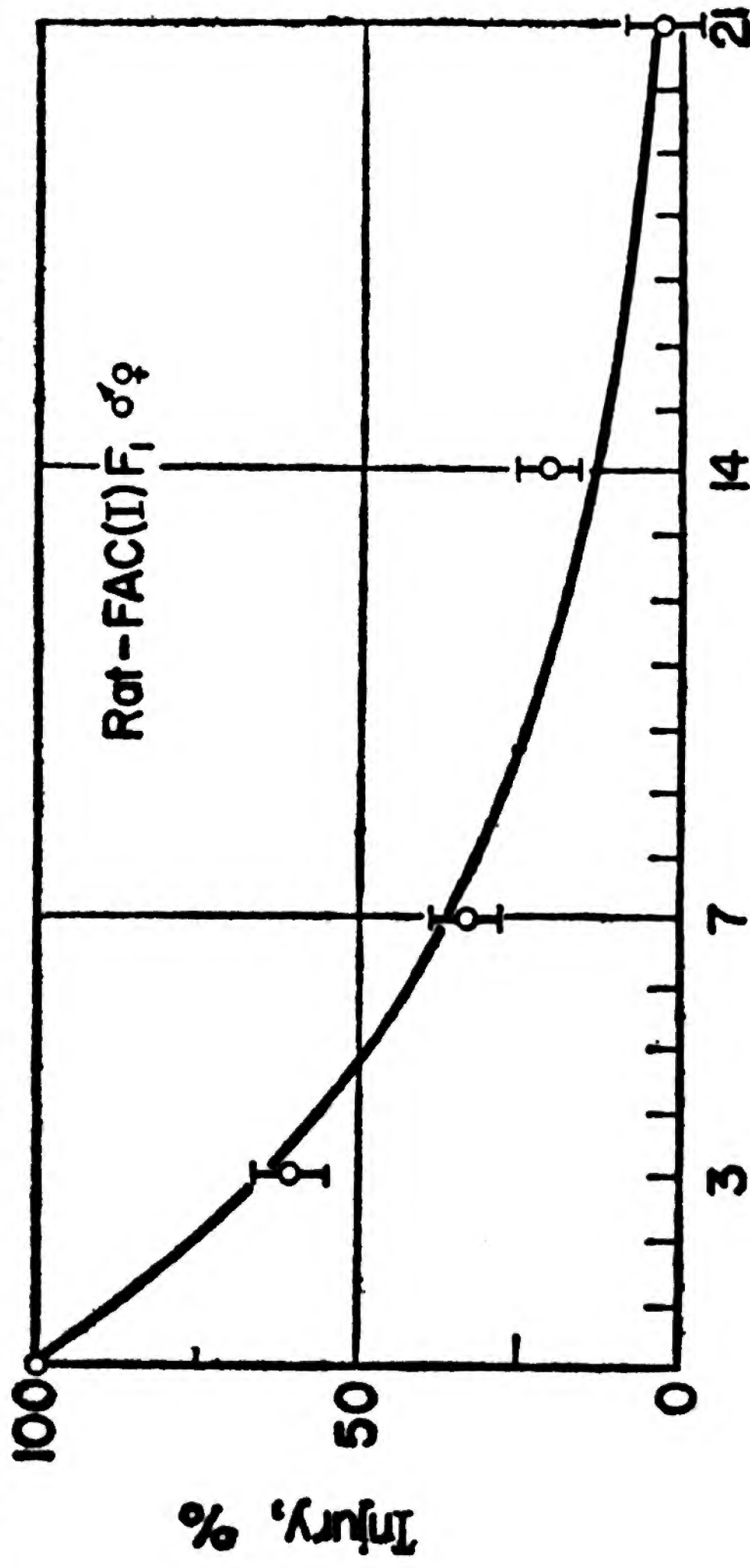
Cobalt-60 DOSE-PROTRACTION ON RADIATION LETHALITY OF SHEEP

DOSE RATE (R/MIN)	METHOD OF EXPOSURE	MEDIAN LETHAL DOSE (LD50)		REFERENCE
		MID-AIR	MID-TISSUE	
		DOSE (R)	DOSE (RADS)	
11.0	Bilateral	237	145	Hanks (1966)
4.35	Bilateral	318	194	Page (1968)
.5	Bilateral	338	206	Page (1968)
.06	Free-moving	495	302	Page (1968)
.033	Free-moving	637	389	Page (1968)

G. E. Hanks, N. P. Page, E. J. Ainsworth, G. F. Leong, C. K. Menkes,
and E. L. Alpen, "Acute mortality and recovery studies in sheep
irradiated with cobalt-60 gamma rays or 1 Mrp x-rays." Radiation Res. 27,
397-405 (1966).

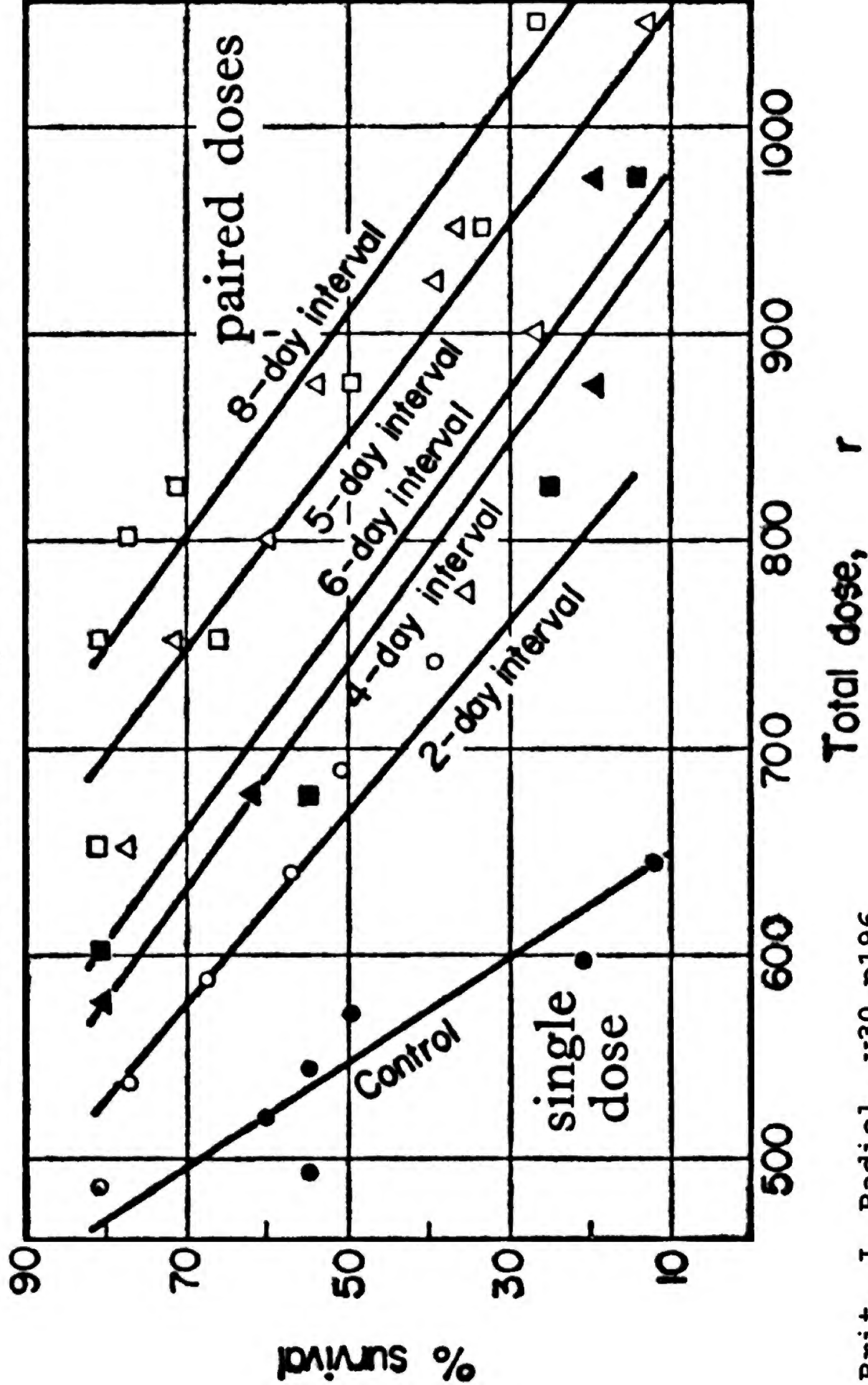
N. P. Page, E. J. Ainsworth and G. F. Leong, "The relationship of exposure
rate and exposure time to radiation injury in sheep." Radiation Res. 33,
94-106 (1968).

Rate of recovery (as measured by LD_{50/30} for X-rays)



Rad. Res., v7, p85 Days after irradiation, 315r

Survival at 30 days of female mice



~~TOP SECRET~~



DEPARTMENT OF DEFENSE

**POLICY GUIDANCE
FOR
THE EMPLOYMENT OF NUCLEAR
WEAPONS (NUWEP) (U)**

OCTOBER 1980

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Review on Oct 2000
Extended by USD(P)
Reason 2-301C 5, 6 & 7, DoD 5200.1-R

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3

IV. STRATEGY FOR EMPLOYMENT

A. Flexibility

(U) The U.S. must have the capability to respond appropriately and effectively to any level of Soviet aggression, over the continuum of nuclear weapon employment options, ranging from use of a small number of strategic and/or theater nuclear capable weapon systems in a contingency operation, to a war employing all elements of our nuclear forces in attacks against a broad spectrum of enemy targets. The ability to respond with selectivity to less than an all-out Soviet attack in keeping with the needs of the situation is required in order to provide the National Command Authorities (NCA) with suitable alternatives, strengthen deterrence, and enhance the prospects of limiting escalation of the conflict. In addition to pre-planned options we need an ability to design employment plans on short notice in response to the latest and changing circumstances. To advance the goal of flexibility, planning will provide an objective-oriented series of building block options for the employment of nuclear weapons in ways that will enable us to employ them consonant with our objectives and the course of the conflict.

(S) As it evolves, the building block approach should provide plans which satisfy a hierarchy of targeting objectives and which will provide the NCA an improved capability to employ nuclear weapons effectively in as measured and controlled a manner as feasible in case of a limited conflict. It should provide complementary elements which can be combined in an integrated and discrete manner to provide larger and more comprehensive plans for achieving politico-military objectives in specific situations. The building block approach places emphasis on the individual elements, their objective utility, and our ability to employ them separately or in total. However, this does not imply that the total plan be finely divisible--practical realities cannot be ignored. The desire for enhanced flexibility in employment must be balanced by practical consideration of the increased complexity incurred in planning and operations, the need to avoid compromising the effectiveness and workability of the larger options, and the need to maintain a responsive decisionmaking and force execution process.

THE WHITE HOUSE

WASHINGTON

#76

~~TOP SECRET/SENSITIVE~~

July 25, 1980

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Presidential Directive/NSC-59

TO: The Vice President
The Secretary of Defense

ALSO: The Assistant to the President for
National Security Affairs
The Chairman, Joint Chiefs of Staff

SUBJECT: Nuclear Weapons Employment Policy (C)

In PD-18, I directed a follow-on study of our targeting policy for nuclear forces. I have reviewed the results and considered their implications for maintaining deterrence in the present decade, particularly in light of the growing Soviet strategic weapons arsenal and its capabilities. (S)

The most fundamental objective of our strategic policy remains nuclear deterrence. I reaffirm the directive of PD-18 to that effect. The purpose of this directive is to outline policies and actions in the nuclear force employment field to secure that continuing objective. (S)

Our strategic nuclear forces must be able to deter nuclear attacks not only on our own country but also on our forces overseas, as well as on our friends and allies, and to contribute to deterrence of non-nuclear attacks. To continue to deter in an era of strategic nuclear equivalence, it is necessary to have nuclear (as well as conventional) forces such that in considering aggression against our interests any adversary would recognize that no plausible outcome would represent a victory on any plausible definition of victory. To this end and so as to preserve the possibility of bargaining effectively to terminate the war on acceptable terms that are as favorable as practical, if deterrence fails initially, we must be capable of fighting successfully so that the adversary would not achieve his war aims and would suffer costs that are unacceptable, or in any event greater than his gains, from having initiated an attack. (C)

~~TOP SECRET/SENSITIVE~~

Review on May 15, 2000

Reason for Extension: NSC 1.13(e)

Downgraded Per per 6/12/09 NSC Mr.Case 2008-085

DECLASSIFIED

Authority 6/12/09 LTR, 08-085
NARA Q Date 7/24/12

The employment of nuclear forces must be effectively related to operations of our general purpose forces. Our doctrines for the use of forces in nuclear conflict must insure that we can pursue specific policy objectives selected by the National Command Authorities at that time, from general guidelines established in advance. (S)

These requirements form the broad outline of our evolving counter-vailing strategy. To meet these requirements, improvements should be made to our forces, their supporting C3 and intelligence, and their employment plans and planning apparatus, to achieve a high degree of flexibility, enduring survivability, and adequate performance in the face of enemy actions. The following principles and goals should guide your efforts in making these improvements. (S)

Pre-planned options. The Single Integrated Operational Plan will provide pre-planned targeting for strikes against the Soviet Union, its allies and its forces. It should provide for retaliatory strikes that will be effective, even if the Soviets attack first, without warning, and in a manner designed to reduce our capability as much as possible. It will be developed with flexible sub-options that will permit, to the extent that survival of C3 allows, sequential selection of attacks from among a full range of military targets, industrial targets providing immediate military support, and political control targets, while retaining a survivable and enduring capability that is sufficient to attack a broader set of urban and industrial targets. In addition, to the maximum extent possible, pre-planned options will be provided for selection in response to specific, lesser contingencies (including attacks on Cuba, SRV and North Korea as appropriate).

While it will remain our policy not to rely on launching nuclear weapons on warning that an attack has begun, appropriate pre-planning, especially for ICBMs that are vulnerable to a preemptive attack, will be undertaken to provide the President the option of so launching. (TS)

Flexibility. In addition to pre-planned options we need an ability to design nuclear employment plans on short notice in response to the latest and changing circumstances. This capability must be comprehensive enough to allow rapid construction of plans that integrate strategic force employment with theater nuclear force employment and general purpose force employment for achieving theater campaign objectives and other national objectives when pre-planned response options are not judged suitable in the circumstances. (S)

To assure that we can design such plans, our goal should be to have the following capabilities on a continuing basis in peacetime, during crises, and during protracted conflict:

- Staff capabilities, within all unified and specified commands which have nuclear forces, to develop operational plans on short notice and based on the latest intelligence.

- Staff capabilities at the seat of Government to support the NCA for coordinating and integrating the nuclear force employment for all commands.
- Intelligence and target development capabilities which permit damage assessment and acquisition of a broad range of targets, fixed and mobile, on a timely basis for military operations. (S)

Reserve Forces. Pre-planned options should be capable of execution while leaving a substantial force in secure reserve and capable of being withheld for possible subsequent use. The forces designated for the reserve should be the most survivable and enduring strategic systems consistent with the need for a flexible and varied reserve force capable of being effectively employed against a wide target spectrum and withheld if necessary for a prolonged period. The secure reserve force will be increased over the next two years to support a more flexible execution of our countervailing strategy. This will be done according to the Secretary of Defense's guidance. (TS)

Targeting categories. Overall targeting planning appropriate to implement a countervailing strategy will result in a capability to choose to put the major weight of the initial response on military and control targets. Military targets must be selected for the purpose of destroying enemy forces or their ability to carry out military operations. Strategic and theater nuclear forces should to the extent feasible be used in combination with, and in support of, general purpose forces to achieve that objective. (S)

More specifically, the following categories of military targets, with appropriate sub-options for different theaters, should be covered in planning:

- strategic and theater nuclear forces, including nuclear weapons storage;
- military command, control, communications, and intelligence capabilities;
- all other military forces, stationary and mobile;
- industrial facilities which provide immediate support to military operations during wartime. (TS)

In addition, pre-planned options, capable of relatively prolonged withhold or of prompt execution, should be provided for attacks on the political control system and on general industrial capacity. (TS)

There must be extensive and effective coverage in the pre-planned options of all categories. Methods of attack on particular targets should be chosen to limit collateral damage to urban areas, general

industry and population targets outside these categories, consistent with effectively covering the objective target, and, where appropriate, overall plans should include the option of withholds to limit such collateral damage. (TS)

Command, Control and Communications, and Intelligence. Flexibility in contingency planning and in operations will be highly dependent on our C³I capabilities, including their ability to acquire targets, assess damage, and survive attack. Strategic stability in an era of essential equivalence depends as much on survivability, endurance and reconstitutability of C³I capabilities as it does on the size and character of strategic arsenals. (C)

PD/NSC-53 directs that our C³I programs and our guidance to telecommunications common carriers support the development and maintenance of such capabilities. In addition, PD/NSC-41 directs that we seek greater continuity of government should deterrence fail. Implementation of PD/NSC-53 and PD/NSC-41 must be pursued in parallel with that of this employment directive. (C)

The relationship of acquisition policy to employment policy. Our acquisition programs must be evaluated in terms of their support for the employment policy ordered by this directive. The required flexibility, survivability, endurance, and target destruction capability must be taken into account in developing programs for acquiring nuclear weapons systems, and their supporting C³I systems, needed to support our countervailing strategy. (S)

Implementation. As new targeting capabilities are developed, and as our operational staffing support change to meet the foregoing directives, they must be reviewed and tested to validate their feasibility and soundness. For that purpose:

- At least two exercises involving the National Command Authorities should be conducted each year to evaluate our capabilities and our employment doctrines.
- Continued study and analysis of means to improve and refine our countervailing strategy of general conflict should be conducted by the Department of Defense.
- The results of these exercises, studies and analysis will provide the bases for modification and any further development of employment and acquisition policy.
- A report will be rendered to the President at least annually on our employment plans, including, but not limited to, on the size and capability of the reserve forces, the degree of flexibility available,

limiting factors in achieving flexibility, and the status of programs to provide improvements.

- Any change or new pre-planned options will be submitted to the President for his review and approval, in accordance with current procedures.
(TS)

NSDM-242 is superseded by this directive. (U)

Jimmy Carter

NUCLEAR WAR STRATEGY

(Concerning President Carter's
25 July 1980 Presidential
Directive PD-59, "Nuclear
Weapons Employment Policy")

HEARING

BEFORE THE

COMMITTEE ON FOREIGN RELATIONS

UNITED STATES SENATE

NINETY-SIXTH CONGRESS

SECOND SESSION

ON

PRESIDENTIAL DIRECTIVE 59

SEPTEMBER 16, 1980

(TOP SECRET HEARING HELD ON SEPTEMBER 16, 1980; SANITIZED
AND PRINTED ON FEBRUARY 18, 1981)

Printed for the use of the Committee on Foreign Relations



APPENDIX

ADMINISTRATION'S RESPONSES TO QUESTIONS SUBMITTED BEFORE THE HEARING

Question 1. What are the basic strategic targeting priorities in PD-59? How do these differ from previous targeting guidance, particularly that contained in NSDM 242?

Answer. PD-59 specifies the development of plans to attack a comprehensive Soviet/Warsaw Pact target system, with the flexibility to employ these plans, should deterrence fail, in a deliberate manner consistent with the needs of the situation and in a way which will deny an aggressor any gain, or would impose costs which clearly exceed his expected gains. This could entail initial retaliation on military and control targets while retaining the capability either to withhold for a relatively prolonged period, or to execute, broad retaliatory attacks on the political control system and on general industrial capacity. These individual target systems, which we feel the Soviet leaders value most, include leadership and control, military forces both nuclear and conventional and the industrial/economic base. Highlights of targeting aspects include an increased number of situation-oriented options, and more flexibility for selectively attacking all categories of targets.

PD-59 requires the option to attack a full range of industrial/economic targets be retained. PD-59 also places more emphasis on how to improve the effectiveness of targeting retaliation against Warsaw Pact leadership and control, nuclear forces, and conventional forces in a wartime situation. In contrast to some pronouncements by the press, the United States has never had a doctrine based simply and solely on reflexive, massive attacks on Soviet cities. Instead, we have always planned both more selectively (options limiting industrial/economic damage) and more comprehensively (a range of military targets in addition to the industrial/economic base). Previous Administrations, going back well into the 1960s, recognized the inadequacy of a strategic doctrine that would give us too narrow a range of options. The fundamental premises of our countervailing strategy are a natural evolution of the conceptual foundations built over the course of a generation. PD-59 is not a new strategic doctrine; it is not a radical departure from past U.S. strategic policy. Our countervailing strategy, as formally stated in PD-59, is in fact, a refinement, a codification of previous statements of our strategic policy. PD-59 takes the same essential strategic doctrine, and restates it more clearly, more cogently, in the light of current conditions and current capabilities.

Question 2. What are the fundamental political and military objectives for strategic targeting in PD-59? Is it envisaged that the United States could, under certain circumstances, conduct limited nuclear war for foreign policy, political or military objectives? Does the PD-59 envision the possibility of U.S. nuclear retaliation for any provocation short of a nuclear attack on the United States or its allies?

Answer. Deterrence remains, as it has been historically, our fundamental strategic objective. The overriding objective of our strategic forces is to deter nuclear war. But deterrence must restrain an adversary from carrying out any of a far wider range of threats than just that of massive attacks of U.S. cities. We seek to deter any adversary from any course of action that could lead to general nuclear war. Our strategic forces also must deter nuclear attacks on smaller sets of targets in the United States or on U.S. military forces overseas, and deter the nuclear coercion of, or attack on, our friends and allies. Our strategic forces, in conjunction with theater conventional and nuclear forces, must also contribute to deterrence of conventional aggression as well. I say "contribute" because we recognize that neither nuclear forces nor the cleverest theory for their employment can eliminate the need for us—and our allies—to provide a capable conventional deterrent.

In our analysis and planning, we are necessarily giving greater attention to how a nuclear war would actually be fought by both sides if deterrence fails. There is no contradiction between this focus on how a war would be fought and what its results would be, and our purpose of insuring continued peace through deterrence. Nor is there a contradiction between this focus and a judgment that escalation of a "limited" to an "all-out" nuclear war is likely. Indeed, this focus helps us achieve deterrence and peace, by insuring that our ability to retaliate is fully credible. We must have forces, contingency plans, and command and control capabilities that will convince the Soviet leadership that no war and no course of aggression by them that led to use of nuclear weapons—on any scale of attack and at any stage of conflict—could lead to victory, however they may define victory.

Operationally, our countervailing strategy requires that our plans and capabilities be structured to put more stress on being able to employ strategic nuclear forces selectively, as well as by all-out retaliation in response to massive attacks on the United States. It is our policy—and we have increasingly the means and the detailed plans to carry out this policy—to ensure that the Soviet leadership knows that if they chose some intermediate level of aggression, we could, by selective, large (but still less than maximum) nuclear attacks, exact an unacceptably high price in the things the Soviet leaders appear to value most—their military forces both nuclear and conventional, their political and military control apparatus, and the industrial capability to sustain a war. In our planning we have not ignored the problem of ending the war, nor would we ignore it in the event of a war. And, of course, we have, and we will keep, a survivable and enduring capability to attack the full range of targets, including the Soviet economic base, if that is the appropriate response to a Soviet strike.

The United States already retains the option of using weapons in a limited way in response to a conventional attack on us or our allies if necessary. However, PD-59 does *not* propose a first strike strategy. We are talking about what we could and (depending on the nature of a Soviet attack) would do in response to a Soviet attack. Nothing in the policy contemplates that nuclear war can be a deliberate instrument of achieving our national security goals because it cannot be. But we cannot afford the risk that the Soviet leadership might entertain the illusion that nuclear war could be an option—or its threat a means of coercion—for them.

Question 3. What alternative targeting strategies were examined in the studies which preceded PD-59? On what grounds were such alternatives rejected? Was the President presented with alternatives to the targeting policy set forth in PD-59?

Answer. Alternative targeting strategies were addressed. The alternative strategies examined were: (a) strengthen existing policy; (b) focus more heavily on denying Soviets a favorable war outcome; (c) add higher confidence capability against some target systems; and (d) rely more heavily on assured destruction.

Under alternative (a) the forces and related C³I to accomplish this strategy would be given added endurance.

Alternative (b) placed more emphasis on targeting of Soviet (and non Soviet Warsaw Pact) nuclear and conventional forces to assure that they could not expect to achieve a favorable outcome or a victory, however victory might be defined, while retaining an assured destruction capability.

Alternative (c) would require greater capabilities against certain Soviet forces than in alternative (b).

The last alternative, (d), also would avoid the need to make any improvements to the flexibility and endurance of strategic forces and C³I.

Each of the alternatives was considered in light of: (a) what flexibility in our nuclear posture (i.e., how broad a range of options) is desired; (b) how much endurance do our forces and C³I require; (c) how much capability is considered necessary; (d) costs of achieving these capabilities.

These considerations were weighed against the ability of each of the alternatives to deter the Soviets, taking into account Soviet attitudes toward concepts of nuclear war and perceptions of our capabilities and will, as well as the perceptions of our friends and allies. In the final analysis, a policy was selected which was judged to be most realistic considering the current relationship between the U.S. and the U.S.S.R., and the world situation, and considering the continued aggressive pursuit by the Soviets of comprehensive improvement in all aspects of military force capabilities, both nuclear and conventional.

A belief in the continuing utility of war as a policy instrument and the need for military superiority fit well into Soviet discussions of victory in a global conflict. It should be noted that Soviet civilian leadership has made statements as to the destructiveness of nuclear war and the need for U.S.-U.S.S.R. arms control measures. At the same time, it is appropriate to take note of high level Soviet statements which tend to point to a somewhat different direction. For instance, the Chief of the Soviet Strategic Missile Forces has observed that:

The imperialist ideologists are trying to lull the vigilance of the world's people by having recourse to propoganda devices to the effect that there will be no victors in a future nuclear war. These false affirmations contradict the objective laws of history . . . Victory in war, if the imperialists succeed in starting it, will be on the side of world socialism and all progressive mankind. (Marshal of the Soviet Union N. I. Krylov, "The Instructive Lessons of History", *Sovetskaia Rossiia*, August 30, 1969, UNCLASSIFIED).

President (and Marshal of the Soviet Union) Brezhnev is also on record as saying that:

Let it be known to all that in a clash with any aggressor the Soviet Union will win a victory worthy of our great people, of the homeland of the October Revolution. (L. I. Brezhnev, Speech on the 50th Anniversary of the October Revolution, *Pravda*, November 4, 1967, UNCLASSIFIED).

In addition to such doctrinal presentations, the Soviet leaders make evident through their programs their concerns about the failure of deterrence as well as its maintenance, and their rejection of such concepts as minimum deterrence and assured destruction as all-purpose strategic theories. As Secretary Brown has indicated, what is most troublesome is the heavy emphasis in Soviet military doctrine on the acquisition of war-winning (whatever the duration of the conflict) capabilities, and the coincidence (in one sense or another of the word) between their programs and what have been alleged as the requirements of a deliberate war-winning strategy. This compilation of Soviet sources—which could be added to almost indefinitely—is sufficient to demonstrate that the Ogarkov quotation used in the speech quoted in the question was not an aberration. There are, to be sure, quotations to be found that indicate different views—partly because there are no doubt different views within the Soviet system, more often because they are addressed to different audiences. There is no question that the Soviet leadership understands that nuclear war would be immensely destructive and uncertain; it is to re-inforce that perception—and to add to it the conclusion, found only very infrequently if at all in public statements, that the U.S.S.R. could not fight and win such a war—that the countervailing strategy is directed.



FOR EXTERNAL PUBLICATION

Radio Moscow in Mandarin to China, Nov. 3, 1978.

"However, the fact is that China's digging deep tunnels can never protect the Chinese masses from nuclear bombing or even protect them from conventional heavy bombs."

* * * * *

Radio Moscow World Service in English, Nov. 16, 1978

"The U.S. Administration is going to launch a 5-year program of civil defense. - - - The only real safety for the Americans is strengthening friendship with the Soviet Union, not bomb shelters."

FOR INTERNAL PUBLICATION

Moscow Voyennyye Znaniya in Russian No. 5, May 1978, p. 33.

"It is appropriate to say that we still meet people who have an incorrect idea about defense possibilities. The significant increase in the devastating force of nuclear weapons compared with conventional means of attack makes some people feel that death is inevitable for all who are in the strike area. However, there is not and can never be a weapon from which there is no defense. With knowledge and the skillful use of contemporary procedures, each person can not only preserve his own life but can also actively work at his enterprise or institution. The only person who suffers is the one who neglects his civil defense studies."

Herman Kahn's Nuclear Escalation Ladder

From his *On Escalation: Metaphors and Scenarios*, N.Y.: Praeger, 1965, **Figure 13.4, p. 39.**

- | | |
|---------------------------------|--|
| Exemplary
Central
Attacks | 31. Reciprocal Reprisals |
| | 30. Complete Evacuation (Approximately 95%) |
| | 29. Exemplary Attacks on Population |
| | 28. Exemplary Attacks Against Property |
| | 27. Exemplary Attack on Military |
| | 26. Demonstration Attack on Zone of Interior |

(Central Sanctuary Threshold)

- | | |
|-------------------|---|
| Bizarre
Crises | 25. Evacuation (Approximately 70 per cent) |
| | 24. Unusual, Provocative, and Significant Countermeasures |
| | 23. Local Nuclear War – Military |
| | 22. Declaration of Limited Nuclear War |
| | 21. Local Nuclear War – Exemplary |

(No Nuclear Use Threshold)

- | | |
|-------------------|--|
| Intense
Crises | 20. "Peaceful" World-Wide Embargo or Blockade |
| | 19. "Justifiable" Counterforce Attack |
| | 18. Spectacular Show or Demonstration of Force |
| | 17. Limited Evacuation (Approximately 20 per cent) |
| | 16. Nuclear "Ultimatums" |
| | 15. Barely Nuclear War |
| | 14. Declaration of Limited Conventional War |
| | 13. Large Compound Escalation |
| | 12. Large Conventional War (or Actions) |
| | 11. Super-Ready Status |
| | 10. Provocative Breaking Off of Diplomatic Relations |

(Nuclear War is Unthinkable Threshold)

- | | |
|-----------------------|--|
| Traditional
Crises | 9. Dramatic Military Confrontations |
| | 8. Harassing Acts of Violence |
| | 7. "Legal" Harassment – Retortions |
| | 6. Significant Mobilization |
| | 5. Show of Force |
| | 4. Hardening of Positions – Confrontation of Wills |

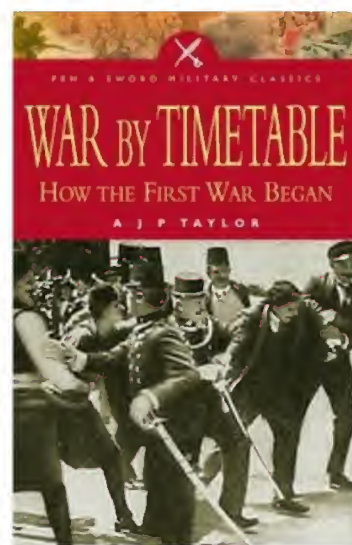
(Don't Rock the Boat Threshold)

- | | |
|--------------------------|---|
| Subcrisis
Maneuvering | 3. Solemn and Formal Declarations |
| | 2. Political, Economic, and Diplomatic Gestures |
| | 1. Ostensible Crisis |

“These conflicts often threatened to bring the alliances into play. For example, if Russia attacked Austria-Hungary as the result of a quarrel over Bulgaria, would Germany be obliged to aid Austria-Hungary, as she had undertaken to do in the Austro-German alliance? Or if Germany attacked France as the result of a quarrel over Morocco, would Russia have to fulfil her promise under the Franco Russian alliance? On the whole, the various powers rejected such consequences. An attack which brought the conditions of the alliance into play would really have to be 'unprovoked aggression', in the later 20th-century phrase. Thus Bismarck steadfastly refused to promise support for Austria-Hungary in the Bulgarian troubles during the 1880s. If she wanted to oppose Russia, he said, she must find other allies- Great Britain and Italy. Later, Russia refused to support France in the two Moroccan crises of 1905 and 1911. France refused to support Russia in the Bosnian crisis of 1908.”

“These inexperienced strategists all held firmly to the dogma that their plans were immutable to the last detail and that improvisation of any kind was impossible. With each elaboration, they became still more the prisoners of their own time-tables. Mobilisation appeared to them a once-for-all operation. It had to be performed in a particular way and would then determine the entire shape of the war which followed.”

- A. J. P. Taylor, *War by Timetable*, 1969



“The nations slithered over the brink into the boiling cauldron of war without any trace of apprehension or dismay... The nations backed their machines over the precipice ... not one of them wanted war; certainly not on this scale.” - David Lloyd George, *War Memoirs*, 1934

Right:
Brooklyn Eagle
 July 1914
 newspaper
 cartoon, titled *A
 Chain of
 Friendship*,
 captioned: “If
 Austria attacks
 Serbia, Russia
 will fall upon
 Austria,
 Germany upon
 Russia, and
 France and
 England upon
 Germany.”



Stumbling into disaster: Britain's 1914 Cabinet



Liberal Prime Minister Herbert Asquith (married with 7 kids) was too busy writing FOUR love letters per Cabinet meeting to mistress Venetia Stanley, to pay attention to Britain's slide to war under Grey.

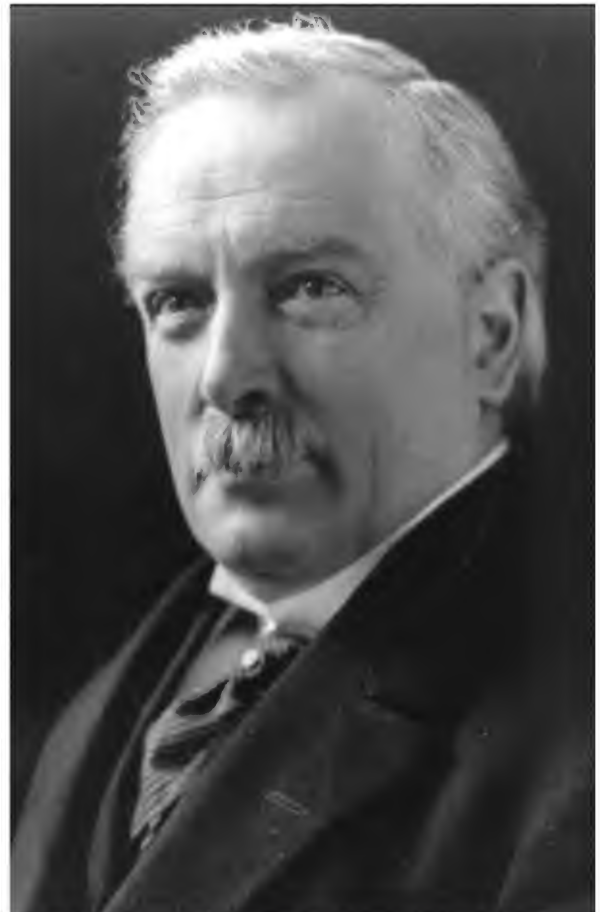


Fly-fishing Foreign Secretary Edward Grey was up to 1 August appeasing Germany into sparing France in exchange for UK neutrality, instead of warning we'd fight!

By the time Grey finally promised war if Germany invaded Belgium, it was too late: Germany had mobilized.



First Lord of the Admiralty Churchill was too busy preparing for war to check on Grey!



Chancellor of the Exchequer David Lloyd George: too busy with domestic affairs!

CIVIL PREPAREDNESS AND LIMITED NUCLEAR WAR

HEARINGS
BEFORE THE
JOINT COMMITTEE ON
DEFENSE PRODUCTION
CONGRESS OF THE UNITED STATES
NINETY-FOURTH CONGRESS
SECOND SESSION

APRIL 28, 1976

Printed for the use of the
Joint Committee on Defense Production



HEARING ON CIVIL PREPAREDNESS AND LIMITED NUCLEAR WAR

WEDNESDAY APRIL 28, 1976

U.S. SENATE AND
U.S. HOUSE OF REPRESENTATIVES,
JOINT COMMITTEE ON DEFENSE PRODUCTION,
Washington, D.C.

The committee met at 10:05 a.m. in room 5302, Dirksen Senate Office Building, Hon. William Proxmire, vice chairman of the subcommittee, presiding.

Present: Senators William Proxmire and John Sparkman.

Senator PROXMIRE. The committee will come to order.

Today's hearing inaugurates a review by the Joint Committee on our Nation's civil preparedness. It is the first such congressional review in over two decades.

By civil preparedness, we mean those mainly civilian measures by which we seek to protect the lives and property of our citizens.

This is the first function of any government. A government which cannot meet this fundamental test of defending its people and the national treasure is not likely to survive for very long.

In subsequent hearings, the committee will examine the adequacy of Federal, State, and local preparedness programs, including plans for fallout shelters, strategic evacuation, preparedness exercises and drills, civil defense stockpiles, and continuity of government. Likewise, the Joint Committee will inquire into the organization of the Government for preparedness. It will also review the Nation's industrial and economic preparedness in terms of the defense industrial base.

This is an especially timely undertaking. Over the past 2 years the United States has been moving from a declared nuclear policy of mutual assured destruction to one of flexible response, or limited nuclear war.

In the minds of some eminent strategists, this implies a lowering of the nuclear weapons threshold, a quickening of the trigger finger on the missile launch console, and an increased probability of uncontrolled nuclear conflict.

But to other equally qualified experts, this shift in strategic doctrine, this shift to larger numbers of more flexible, or more versatile and accurate weapons and control systems does not undermine deterrence of nuclear war; instead, it enhances deterrence.

Well, it can't be both ways and whenever you have such a complete divergence in expert opinion, it is time for a careful review of the facts.

These hearings are also timely in that there are increasing rumors of a civil defense gap, with the Soviet Union well in the lead.

In this year's annual report, Defense Secretary Rumsfeld stated that, and I quote:

An asymmetry has developed over the years that bears directly on our strategic relationship with the Soviets and on the credibility of our deterrent posture. For a number of years, the Soviets have devoted considerable resources to their civil defense effort which emphasizes the extensive evacuation of urban populations prior to the outbreak of hostilities, the construction of shelters in outlying areas, and compulsory training in civil defense for well over half the Soviet population. The importance the Soviets attach to this program at present is indicated not only by the resources they have been willing to incur in its support, but also by the appointment of a deputy minister of defense to head this effort.

Now, the term "asymmetry" used by the Secretary sounds to a non-expert like me like a four-bit word for "gap." We have heard a great deal over the years about gaps that never materialized or proved unimportant. Yet we have spent a lot of money to eliminate the non-existent or the insignificant. It is for this reason that the committee last week published the declassified text of the 1957 Gaither Report which invented the first missile gap.

3

**STATEMENT OF HON. PAUL NITZE, FORMER SECRETARY OF THE
NAVY, DEPUTY SECRETARY OF DEFENSE, AND MEMBER OF THE
SALT DELEGATION**

Mr. NITZE. Mr. Chairman, my interest in the questions which this committee is discussing began in 1944 when I was asked to be a director of the U.S. Strategic Bombing Survey. The required qualification of the directors was that they have no prior knowledge of military strategy or of air power, and could thus be presumed to be unbiased in appraising the effects of the immense U.S. strategic air effort in World War II. I spent the next 2 years in Europe and then in the Pacific in intensive work, in association with what I believe to have been the best talent available to this country, to try to understand something about both subjects. In the Pacific portion of the survey, as Vice Chairman, I was in effective command of the operation, including the detailed study of the effects of the weapons used at Hiroshima and Nagasaki.

Since that time much has changed. Weapons have increased in yield and missiles now have an intercontinental range. But these changes are hardly as revolutionary as the changes brought about by the role of effective air power in World War II and of the introduction of nuclear weapons in its closing phase. After all, the largest number of our nuclear reentry vehicles today are Poseidon warheads, each of which has an equivalent megatonnage less than twice that of the weapons used at Hiroshima and Nagasaki.

At Hiroshima and Nagasaki there was no air-raid warning and very few people availed themselves of the crude civil defense facilities which were available. Most of those that did, even at ground zero, in other words, directly under the explosion, which was at the optimum height of burst, survived. The trains were operating through Hiroshima 2 days after the explosion.

Let me paraphrase from an interchange I had in 1960 with Colonel Lincoln, head of the faculty at West Point, on this subject :

The Russians are careful students of Clausewitz. I do not believe they would ever ignore either the danger that a war once started might escalate to the full violence which the pure theory of war might indicate; on the other hand, they would never forget that war is a tool of policy and that every effort must be made to avoid letting it so escalate.¹

¹ In this connection the following quotation from *Communist of the Armed Forces* in November 1975 is pertinent: "The premise of Marxism-Leninism on war as a continuation of policy by military means remains true in an atmosphere of fundamental changes in military matters. The attempt of certain bourgeois ideologists to prove that nuclear missile weapons leave war outside the framework of policy and that nuclear war moves beyond the control of policy, ceases to be an instrument of policy and does not constitute its continuation is theoretically incorrect and politically reactionary."

On the other hand, I can well imagine that they might consider a controlled nuclear conflict in which significant military targets, but not urban-industrial targets, are the initial objects of attack, if they thought war unavoidable.

In conclusion, I would like to comment on this committee's print containing the Gaither Report of 1957.

I have now read that report for the first time in nearly 20 years. I am impressed—especially in light of the information then available to the Gaither committee—by the care and comprehensiveness of that committee's examination of the problems assigned to it for study. I note in contrast the cavalier imprecision reflected in the foreword prepared by this committee's staff.

It is not true that the Gaither Report ignored arms control, nor is it true that the report spoke of U.S. strategic inferiority as then a fact. To the contrary, the Gaither Report described the United States as then "capable of making a decisive attack on the U.S.S.R." In view of SAC's vulnerability "to a surprise attack in a period of lessened world tension," the Gaither Report also noted the U.S.S.R.'s capability to make "a very destructive attack on this country."

The report then observed, "As soon as SAC acquires an effective 'alert' status, the United States will be able to carry out a decisive attack even if surprised," and it anticipated that juncture "as the best time to negotiate from strength, since the U.S. military position vis-a-vis Russia might never be so strong again."

In attempting to disparage the Gaither committee's analysis, the staff foreword cites a subsequent estimate "* * * that at the time of the Gaither Report the Soviet Union probably had fewer than a dozen operational ICBMs." In fact, at the time of the Gaither Report—only a few weeks after the sputnik launching—the Soviet Union obviously had no operational ICBMs. The Gaither Report made no assumption to the contrary. Indeed, it postulated 1959 as the probable year the Soviet Union would first have operational ICBMs; in fact, they first became operational in 1960. What was crucial at the time was not only the question of how many ICBMs would be operational when, but even more importantly the question of the speed with which the U.S. Air Force could achieve adequate early warning facilities and an appropriate alert posture.

The Gaither Report focused attention on those questions.

Mr. Chairman: My interest in the questions which this Committee is discussing began in 1944 when I was asked to be a director of the U.S. Strategic Bombing Survey. The required qualification of the directors was that they have no prior knowledge of military strategy or of air power, and could thus be presumed to be unbiased in appraising the effects of the immense U.S. strategic air effort in World War II. I spent the next two years in Europe and then in the Pacific in intensive work, in association with what I believe to have been the best talent available to this country, to try to understand something about both subjects. In the Pacific portion of the Survey, as Vice Chairman I was in effective command of the operation, including the detailed study of the effects of the weapons used at Hiroshima and Nagasaki.

Since that time much has changed. Weapons have increased in yield and missiles now have an intercontinental range. But these changes are hardly as revolutionary as the changes brought about by the role of effective air power in World War II and of the introduction of nuclear weapons in its closing phase. After all, the largest number of our nuclear reentry vehicles today are Poseidon warheads, each of which has an equivalent megatonnage less than twice that of the weapons used at Hiroshima and Nagasaki.

At Hiroshima and Nagasaki there was no air-raid warning and very few people availed themselves of the crude civil defense facilities which were available. Most of those that did, even at ground zero, in other words, directly under the explosion, which was at the optimum height of burst, survived. The trains were operating through Hiroshima two days after the explosion.

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The Russians are careful students of Clausewitz. I do not believe they would ever ignore either the danger that a war once started might escalate to the full violence which the pure theory of war might indicate; on the other hand, they would never forget that war is a tool of policy and that every effort must be made to avoid letting it so escalate.

I believe they will always pay close attention to the interrelationship of the offense and the defense and not ignore either side of the equation. I cannot believe they would so ignore the military core of war as to consider the type of controlled nuclear conflict discussed in some of the papers circulated by the Committee's staff where military targets are avoided and industrial targets are hit. On the other hand, I can well imagine that they might consider a controlled nuclear conflict in which significant military targets, but not urban-industrial targets, are the initial objects of attack, if they thought war unavoidable.

In conclusion, I would like to comment on this Committee's print containing the Gaither Report of 1957.

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The Gaither Report focused attention on those questions. Thereby the Report became a factor in stimulating an enormous effort on the part of the U.S. to move ahead with pertinent strategic programs. In those years the rate of expenditure on strategic programs was, allowing for inflation, about two and a half times the present rate. For all the great expense, the program was a bargain when considered against the calamitous potential consequences of permitting the strategic relationship to become unstable to the detriment of U.S. security and with increased risk to the maintenance of peace.

The Report placed first priority on the military measures necessary to maintain strategic stability and high quality deterrence. It placed a lower priority on those measures necessary to ensure survivability of the population in event deterrence were to fail. The two classes of measures are, however, interrelated.

STATEMENT OF HERMAN KAHN, DIRECTOR, HUDSON INSTITUTE

Senator PROXMIRE. Mr. Kahn.

Mr. KAHN. It is customary to start one's testimony with a statement of qualifications. Let me instead start with a disqualification.

I haven't really been spending very much time in the military field since 1965, but I started to go back last year, and I am now in the middle of reacquainting myself with the issues.

I might say though that comparing today's discussion to the sixties, there has been very little substantial improvement. In fact there have been some retrogressions. This both disturbs and surprises me.

Let me start by agreeing with Paul on two issues. The chairman just stated we can't have both increased and decreased deterrence. I believe that there are many measures which can go in both directions.

There are many measures which increase deterrence in one scenario or context, and decrease deterrence in another scenario or context. In particular, if one focuses on this abstract war, what Paul referred to as a pure military war, or a surprise attack out of the blue directed against civilians, then it is terribly easy to do many things which will decrease that deterrence.

But since I tend to feel we have, relatively speaking, too much deterrence of this situation I do not object to decreasing the deterrence of surprise attack out of the blue in favor of increasing deterrence in other situations. In fact there has been much too much attention to this simple situation. I know back in 1960, a number of polls were taken by Tom Schelling, by Weapon Systems Evaluation Group (WSEG) and others. In these polls analysts were asked "If a war occurred, what scenario do you think would have preceded the war?"

Almost universally, they agreed there would have been a very tense situation, say bombs bursting in Europe, and then either an attack by the Soviets because they got into serious trouble, an accidental war, or an attack by the U.S. All the analysts agreed that a surprise attack out of the blue, directed at cities, was far and away the least probable way that a war was likely to start.

And yet they all also agreed that 90 percent of their personal studies and effort went to that case and the other 10 percent or so went into a study of a surprise attack out of the blue which hit military bases. In other words, the analysts agreed, that even though they were able

to choose their own subjects of study, they were spending almost all of their time on scenarios which, in their judgment, were not probable or important. They simply were the easiest things to study and talk about.

[Additional remarks:]

Many analysts are still doing this, but do not seem to know that this emphasis distorts the realistic priorities.

Now, when we looked at civil defense in 1960—or today—it was really almost impossible to protect the population against a surprise attack directed against them. We found that it was also impossible to protect an economic base for massive war production against a surprise attack directed against the economic base.

Therefore, we did not ask ourselves, as a high priority, what does civil defense do for these objectives in these scenarios.

However we did not stop there. We went on to ask ourselves if there were any other roles for civil defense.

It seemed to us that there were a large number of roles. All of them tended to be second or third priority but still terribly important. When people said, "But that doesn't do any good in the first priority situation," we answered, "We don't care."

The first, perhaps the most important role, is to protect people when they are not targets. I am prepared to believe that doing this decreases deterrence, but I am willing to do it anyway.

I know when I examine the problem of attacking the Soviet Union that I want to preserve Moscow and Leningrad, my two biggest assets, and anything they do to make Moscow and Leningrad safe from becoming bonus targets improves my ability to plan war against the Soviets. Moscow and Leningrad are important to the Soviets and they are probably willing to do that. Deterrence is not the sole objective of policy.

In a book called *On Thermonuclear War* which I published in 1960, we mentioned what we called the Doomsday Machine was the highest possible deterrent, yet nobody wanted it. I might also mention that I made clear, in that book, that we didn't think there was any missile gap. In fact, just to go back over a little history of that, most people's recollection of the debate of that period tends to be wrong.

It is not true that the Democrats raised the issue of a missile gap against the Republican administration. That was a Republican statement. The Republicans predicted the Russians would have 300 missiles by 1960. But at the same time, the Republican administration said this wouldn't make any difference, because we had 2,000 bombers and they were more important than 300 missiles.

The great contribution of the Gaither Report, as Paul just said, was to make clear that if the Soviets had 300 missiles and we did not have any kind of warning system, then we might not have 2,000 bombers, because they could be destroyed by a surprise attack while still on the ground.

I also made clear, that while the Soviets probably would not have 300 operational missiles in 1960, if they did have them, we would be in trouble—that is, despite the predictions by the Republican administration we did not think they had such a force—but we were not sure.

What does one do when the other side may be able to do something in the near future and if one waits until he is certain before reacting, it is too late, while if one reacts early it may turn out to have been unnecessary?

Let me also make a remark about a release I saw from this committee which listed a series of predicted gaps which did not occur. In at least half the cases, people were rather clear that the gap might not occur, but they were not sure.

[Additional remarks:]

But they felt they had to worry about it ahead of time and even make some preparations because they could not afford to wait until all the facts were in.

Let me ask a question: What do you do if the other side exhibits a weapon system and has the production capability? You are not quite sure what he is going to do. Do you wait until he does it or do you worry about it?

In general this is a very complicated issue. In some cases, we almost have to make preparations ahead of time, even though they may be wasted. In other cases, we should wait until we are more sure; in still other cases, one just hopes for luck. But one should not, in my judgment, downgrade responsible officials who get concerned under such circumstances.

I might also draw attention to some studies done by Albert Wohlstetter. It is pointed out in these studies that in most cases, we have underestimated rather than overestimated U.S.S.R. future capability. I will ask that this report be sent to the committee.

If you look at the record, there has been more a problem of underestimation than overestimation. This is true in terms of the number of missiles the Soviets have had over time and in terms of Soviet capability on all kinds of other issues. We tend to remember the discussion when some hysterical people overstate the problem; then it turns out to be wrong. I would argue this is not at all the characteristic problem.

Let me turn to the major point I wanted to make today. I would argue that the scenario I worry about as the most probable scenario, is also the scenario which is least discussed. This is the case where there is opportunity for significant or even all-out mobilization before major thermonuclear attacks against the cities occur.

There are two recent and useful historical examples which illustrate this concept, the Korean War and World War II.

In June 1950, Congress was debating whether the budget should be \$15, \$16 or \$17 billion. The previous year it had been \$13 billion. A number of distinguished witnesses testified that \$18 billion would strain the economy, but \$16 billion was all right. North Korea marched on South Korea, and within 1 year, Congress authorized \$60 billion, an increase by a factor of 4.

This was totally unexpected and totally changed the strategic problem. One should note that it would not have been possible to fit into even an \$18 billion budget hardly any of the weapons systems we have procured since World War II. One could not have bought a Sage system, a B-47 system, a B-52 system, a Nike Hercules system, a Polaris system, and so on. None of these systems would have been feasible at the \$5 or \$6 billion budgets per service which were, roughly, current at that time.

As a result of this authorization, the Air Force budget was increased by about a factor of 5. The other two services had an increase of about 3. As a result, a whole new range of possibilities opened up for the services.

I can easily envisage a scenario for crisis in the future which involves military budgets of \$500 billion or more. That would change, if you will, the whole character of strategic planning. I do not expect any such situations to arise with high probability, but I do not consider it paranoia or unwise to prepare for such situations.

Probably an even better prototype for the situation we are thinking about is pre-World War II. After World War I, much of the world became sick of war, and war became "unthinkable" to most people, particularly in the victorious "Allied Powers." Strategists and publicists talked about poison gas and knock-out blows; they thought all the capital cities would be destroyed by poison gas in the first few days of a war. They did not understand the idea of limitations in warfare—of mutual deterrence even after hostilities have broken out.

When Hitler got elected in 1933, people became interested in larger defense budgets. Then he marched into the Rhineland and, of course, defense budgets increased slightly. Then there was the Anschluss and then Munich, and more substantial increases in military budgets. With the invasion of Czechoslovakia, everybody got deeply concerned. Then, finally, there was the invasion of Poland, the formal declaration of war and then 7 months of more or less "phony war." As a result there was opportunity on both sides for 7 months' of full-time war production, before the war really opened up.

We would argue that similar possibilities should be considered today. Nobody is interested in jumping into a nuclear war today. Nobody is going to want to execute the usual picture of nuclear war, in which each side presses every button and goes home. It is extraordinarily difficult to believe such a scenario.

It might happen. But I would be willing to bet, if this were a betting matter, 50 to 1 against it.

On the other hand, the situation might arise in which there was a declaration of war, followed by a phony war, or a serious confrontation in which there were credible threats of war. By the way, in such a confrontation, the following dialog tends to occur.

Both sides are saying to the other side, "There is absolutely nothing at risk which justifies this terrible danger to which we are subjecting each other and the rest of the world. It is clear that whatever we are arguing about is simply not worth the risk of a thermonuclear war. Therefore, one of us has to be reasonable—and it isn't going to be me."

That is, by the way, a terribly persuasive argument.

At this point, each side is trying to explain why the other side should be reasonable. You don't have to have a great defense to do that. All you have to be able to do is say, "I believe my defense establishment is better than yours, in important ways."

I can imagine the Russians telling us, "You are telling us the money we spent on our defense establishment does us no good, but we spent it because we thought it does do good. We believe that this defense establishment of ours works. You don't, but we believe it does."

If you can get that point across, you are going to put great pressure on the other side to back down.

Senator PROXMIRE. Very strong chance of what? I missed that.

Mr. KAHN. If we believe that they believe they have confidence in their establishment, we are going to back down, whether or not their

confidence is justified, because we would be destroyed almost as much as a result of their mistaken belief as by a correct one. If the other man can give you a credible picture, that he believes he has a serious edge over you, then even if he does not objectively have that edge, you may be in trouble.

That is even more true for allies. If they think the other side believes it has an edge, the allies are going to hedge. Finally it is even more true for neutrals that in a bargaining situation the strategic balance is very complex (which should be an obvious point) and the outsider is likely to be excessively influenced by appearances. Who strikes first and how many are dead in each city are almost irrelevant to many of these issues.

Finally, a last point. When we write scenarios for nuclear war, we find it difficult to write a credible scenario which doesn't involve months or weeks of warning. I would guess we are as good at writing scenarios as anybody in the world. We have certainly written as many.

I want to warn the committee, on the other hand, that when we looked at World War I, we didn't find that scenario plausible. The mere fact we can't write a plausible scenario for a war doesn't mean it can't occur, because one can find historical examples to the contrary.

Nevertheless, every scenario we write for nuclear war involves days, weeks or months of tension. Evacuation, last moment mobilizations are extraordinarily possible. By the way, evacuations occur not as a result of secret intelligence or in any attempt to try to outrun the missiles or the bombers. The *New York Times* and the *Washington Post* provide the warning perhaps days before the attack. People or governments then get frightened and decide to decrease their vulnerability to attack. The idea is, can you exploit such warning if it is printed in the papers?

[Complete statement follows:]

SUMMARY PAPER AND BRIEFING NOTES ON THE POTENTIAL OF THE DEFENSE MOBILIZATION BASE CONCEPT BY HERMAN KAHN, WILLIAM BROWN, AND WILLIAM SCHNEIDER, JR.

This submission is the responsibility of the authors and is not to be construed as representing any official opinions of the Hudson Institute or any other associated individuals or agencies.

PREFATORY NOTE

The following paper represents a summary of studies developed by the staff and consultants of the Hudson Institute more or less continuously over the last fifteen years although naturally it focuses more intensively upon recent work—in particular, a summary of a report on the concept of mobilization warfare by Herman Kahn and William Schneider, Jr. Most of Hudson's program of civil defense and mobilization base studies has been accomplished under the direction of William Brown, Herman Kahn and William Schneider, Jr. and at least half the Institute's personnel have participated in one or more of them. This particular submission was prepared as a joint paper by the three people named above.

MOBILIZATION WARFARE

1. The concept of mobilization warfare

The notion of mobilization in a nuclear age has the appearance of a contradiction in terms when arrayed against the conventional concept of mobilization. Mobilization has in general, been associated with the redirection of national resources, both human and material away from traditional civilian pursuits to support a defense effort. To some extent, it has been possible to conceive of a limited mobilization of military forces and associated national resources to support

limited political objectives although the more traditional perception has been associated with a general mobilization of the entire industrial might and armed forces of a nation.

The possibility of intercontinental strategic nuclear attack made possible through the development of ICBM's, missile firing submarines, and long-range bombers have made the initiation and conclusion of a nuclear conflict appear to be a matter of hours or days, and certainly not more than a few weeks in duration, making the traditional notion of mobilization appear to be as archaic and obsolete as the forces and weapons that had been in the past, mobilized.

This study is intended to advance the concept that mobilization is an important component of strategic nuclear conflict, and, we will argue, is likely to be the prototype of any U.S.-Soviet nuclear conflict should such a conflict occur. The concept can be most simply characterized from the perspective of the following simple generalized scenario: During a period of intense political crisis between the U.S. and the Soviet Union, both sides fear that a nuclear war may actually occur. However, neither side is willing to risk the consequences of a nuclear war with the existing levels of forces and defenses (military and civilian). As a consequence, each of the parties attempts to develop on a frantic basis, a very large-scale effective nuclear offense and defense capability which is associated with genuine fears about the possibility of a general war. The period of mobilization during and after an intense political crisis characterizes what we describe as "mobilization warfare." It is warfare in the sense of an intense and bitter competition of an accelerated arms race, but without the certainty that direct military action will occur. A plausible outcome of this scenario is that the side which mobilizes most effectively within a relatively brief period of time (say six months to two years) can achieve a dominant position capable of inhibiting the diplomatic efforts of the other.

The notion of "mobilization warfare" is not restricted only to strategic nuclear warfare. It is also applicable, for example, to a U.S.-Soviet struggle in Europe in which an intense political crisis raises the specter of an outbreak of conventional warfare between the two nations without the expectation that such a conflict would lead to a strategic or tactical nuclear exchange.

Perhaps the closest parallel to mobilization warfare during the nuclear era arose as a consequence of the Korean war. The ominous character of Soviet foreign policy following World War II culminated in the Soviet sponsored attack of North Korean forces against the Republic of Korea. The direction in Soviet foreign policy after World War II was not offset by any rebuilding of U.S. military power which had been rapidly dismantled after the end of World War II. However, when the Soviets authorized the attack on Korea, the change in U.S. attitudes regarding preparedness for a U.S.-Soviet strategic nuclear contingency was electric. One measure of the character of this concern, a measure characteristic of a serious mobilization, was the decision of the Congress to increase annual defense expenditures from \$16 to the \$60 billion authorized after the outbreak of the Korean war. This vast increase in authorized expenditure made possible a set of strategic programs that were simply not feasible within the prior U.S. defense budget. The new authorization made possible the B-52, the B-47, the Polaris Program, and Atlas Program and a host of related technological initiatives whose consequences are still influencing the shape of the U.S. strategic program today. It also developed a reasonable (for the time) civil defense program designed to move the more vulnerable portions of the home population rapidly to safer areas. As a consequence of this enormous build-up of strategic nuclear capability arising out of the concern over a possible U.S.-Soviet nuclear conflict in the early 1950s, the United States achieved for more than a decade a stark nuclear superiority over the Soviets. This superiority was so vast that in retrospect it appears clear that the Soviets were almost totally deterred from attempts to exert military power in support of their diplomatic objectives throughout the late 1950s and early 1960s.

In the early 1950s the Soviets also attempted to develop a larger strategic program, but were much less successful than the United States. This form of mobilization warfare, we argue, is more likely to become a "standard" mode of nuclear conflict with the Soviet Union than the commonly anticipated mode, namely a large-scale exchange of nuclear weapons.

Perhaps the most significant difference between traditional mobilization concepts and the concept of "mobilization warfare" that is the focus of this paper is that in a modern mobilization, the adequacy of a period of mobilization may be "tested" only in the sense that it can affect the perceptions of an opponent without

a shot being exchanged. Moreover, the period of mobilization in the modern era might be considerably more compressed and complicated than any which we have experienced in this century. In a very practical sense, the mobilization of Germany and the allied powers before the first World War was a traditional process which extended over a period of many years, although the most intense efforts took place after the initiation of the conflict. Similarly, the German and Japanese pre-war mobilization of their forces occurred over many years. In both cases, a large-scale and protracted conflict followed. Under modern conditions, a nuclear conflict between major powers is likely to be short compared to previous conflicts or to any period of mobilization.

The concept of mobilization warfare in a nuclear era implies relatively short reaction times with the ability to deploy major offensive as well as active and passive defensive systems which may be extremely costly and complex by any prior standards. Under such circumstances, it is entirely plausible that the U.S. strategic budget alone could constitute an expenditure of several hundreds of billions of dollars per year. Expenditures at such huge levels make possible a very wide range of military and non-military defense systems that could not be seriously considered with recent strategic budgets—less than \$10 billion.

For example, potentially high grade missile defense systems employing lasers, particle beam technology and other advanced concepts for boost phase, mid-course, and terminal interception could, in principle, be procured under conditions of "mobilization warfare." The crucial determinants for acquiring such a capability lies in the prior research and development program and in proper institutional orientation toward a mobilization potential. The requirements of a "mobilization base" to support the notion of mobilization warfare is sufficiently different from the objectives of existing research and development needed to support current and near-term defense requirements that expenditures for a mobilization base should be partitioned from other R&D expenditures. The primary function of a mobilization base is to facilitate the shortening of lead times to procure highly effective strategic forces, active defenses, and civilian protection, should a decision to procure such a capability be made in a context that requires such a build-up be completed in an extraordinarily short period of time (short, that is, by the standards of recent experience). Under some circumstances, it is sufficient simply to have "paper plans" say, for the conversion of designated industrial potential from civilian to military uses. In other cases, where the requirements are more critical, and less easily adaptable to short-term changes, some limited development or prototyping may be necessary. In still other cases, particularly where the function is highly complex and likely to involve large numbers of both civilian and military personnel, such as an ABM or civil defense system, it may be necessary to conduct a limited deployment or field testing, and to develop the professional cadres who could support a vast expansion if and when circumstances require such expansion. The decision as to what elements of a potential U.S. strategic posture should be most extensively or rapidly developed would depend upon the contribution such efforts would make to reducing the lead times necessary to deploy the capability during a period of intense mobilization. The United States already possesses a substantial infrastructure for the rapid short-term expansion of U.S. strategic forces. With relatively modest expenditures, it should be possible to dramatically improve the ability of the United States to mobilize rapidly during an appropriate crisis to increase strategic nuclear forces, its active and passive defenses, and its general purpose forces without the protracted lead times that we have tended to become accustomed to over the past two decades.

2. A baseline mobilization warfare scenario

The implausibility of a U.S.-Soviet strategic nuclear exchange in recent politico-military circumstances has tended to obscure the fact that there are numerous possibilities for a major clash of interests between the superpowers; and consequently, for escalation.

The scenario proposed here arises out of the Achilles' heel of the Soviet Union, the behavior of their East European satellites, in this case, East Germany. Internal dissension develops beyond the control of the local and Soviet political and military leadership in East Germany to the point where large-scale border crossing into West Germany by deserting elements of East German armed forces involve the NATO nations. Unlike the standard escalation scenario where such events lead ultimately to a U.S.-Soviet nuclear exchange, the potential escalation, itself, becomes a force for restraint.

TYPICAL STRATEGIC MOBILIZATION SCENARIOS

Of the four scenarios given below, the first two are history, the third used to be the great fear of NATO, and the fourth is probably the great fear of the Warsaw Pact.

1. The "phony war," 1940 (5 months) :
 - (a) Pre-crisis arms competition (UK, France, Germany and the U.S.S.R.).
 - (b) A major series of political-military crisis—
 - Militarization of the Rhineland (1936) ;
 - Anschluss (Austria) (1938) ;
 - Sudeten crisis (1938-39) ;
 - War in Poland (1939).
 - (c) De-escalation and negotiation (antagonists began a rapid buildup fearing a resumption of full scale conflict).
2. Korea (1950-53) :
 - (a) Pre-war politico-military crises—
 - Soviet invasion of Iran (1946) ;
 - Soviet takeover of East European nations (1945-48) ;
 - Berlin blockade (1948) ;
 - Soviet intervention in Turkey and Greece ;
 - Soviet military buildup, post WW-II.
 - (b) Major turnabout in U.S. policy—
 - Factor of four increase in defense expenditures in 18 months ;
 - Massive emphasis on strategic preparedness, especially active defense.
3. Successful Soviet attack on W. Berlin and subsequent de-escalation.
4. Uprising in East Germany gets out of control and escalates.

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CHARACTERISTICS OF A SPECIAL MOBILIZATION SCENARIO: A FORMAL DECLARATION OF WAR BY THE U.S.

1. The declaration would have solemn and especially great significance for our enemies, allies, and neutrals.
2. The information transferred would have :
 - (a) Unambiguous factual content of great importance ;
 - (b) Undeniable implications and symbolism ;
 - (c) Highly uncertain interpretations or implications.
3. Its existence would preempt "ordinary" crisis negotiation and deny the stability of any recent *fait accompli*.
4. In some extreme crises it could be temporizing—a declaration is not a spasm response—and lead to deescalation of actual fighting.
5. But it implies a rapid response to any increased use of force.
6. It tends to force a decision by allies to cooperate actively.
7. It would justify many peripheral actions (blockades, interdiction, property confiscation, internment of hostile aliens, etc.).
8. It would tend to unify the national response—and increase defense spending enormously through mobilization.
9. It would convey the unambiguous message that a *formal* peace treaty will be required to settle all the important issues.

ROLE OF RESEARCH FOR MOBILIZING ACTIVE DEFENSES

1. Missile defense probably would be the most important and expensive effort.
 2. Lead-time reduction becomes extremely important.
 3. A program is required to facilitate rapid massive procurement of mutually reinforcing systems—
 - Boost phase interception ;
 - Mid course interception ;
 - Terminal interception.
 4. A capability may soon be needed to support a war in space.
 5. A capability is required for integration into other—high priority strategic mobilization programs—
 - Air defense ;
 - Civil defense.
- Major research objective: design systems which are highly effective, mutually supporting and which can be rapidly deployed at high levels of expenditure.

APPENDIX I

PAUL HENRY NITZE

In the spring of 1969, Paul Henry Nitze was appointed the representative of the Secretary of Defense to the United States Delegation to the Strategic Arms Limitation Talks with the Soviet Union; a position he held until June 1974, at which time he resigned.

Mr. Nitze resigned from his duties as Deputy Secretary of Defense on January 20, 1969, a position he had held since July 1, 1967, succeeding Cyrus R. Vance.

Mr. Nitze was serving as 57th Secretary of the Navy when he was nominated by former President Lyndon B. Johnson on June 10, 1967, to become Deputy Secretary of Defense. He was confirmed by the United States Senate on June 29, 1967.

The late President John F. Kennedy nominated Mr. Nitze to be Secretary of the Navy on October 14, 1963. At that time he was serving as Assistant Secretary of Defense (International Security Affairs), having assumed that position on January 29, 1961. He began his duties as Secretary of the Navy on November 29, 1963.

Graduated "cum laude" in 1928 from Harvard University, Mr. Nitze subsequently joined the New York investment banking firm of Dillon Read and Company. In 1941, he left his position as Vice President of that firm to become financial director of the Office of the Coordinator of Inter-American Affairs.

From 1942-1943, he was Chief of the Metals and Minerals Branch of the Board of Economic Warfare, until named as Director of Foreign Procurement and Development for the Foreign Economic Administration.

During the period 1944-1946, Mr. Nitze was Vice Chairman of the United States Strategic Bombing Survey. He was awarded the Medal of Merit by President Truman for service to the nation in this capacity.

For the next seven years, he served with the Department of State, beginning in the position of Deputy Director of the Office of International Trade Policy. In 1948, he was named Deputy to the Assistant Secretary of State for Economic Affairs. In August, 1949, he became Deputy Director of the State Department's Policy Planning Staff, and Director the following year.

Mr. Nitze left the federal government in 1953 to become President of the Foreign Service Educational Foundation in Washington, D.C., a position he held until January 1961.

Mr. Nitze is Chairman of the Advisory Council of The Johns Hopkins School of Advanced International Studies in Washington, D.C., and also serves on the Board of Trustees of the University. He holds memberships on the Board of Directors of Schrodgers, Inc., in New York, and Schrodgers, Ltd., in London, The American Security and Trust Company of Washington, D.C., Northwestern Mutual Life Mortgage and Realty Investors of Milwaukee, Wisconsin, and is Chairman of the Board of the Aspen Skiing Corporation.

HERMAN KAHN

Herman Kahn was born in Bayonne, New Jersey, in 1922. He received a B.A. from UCLA in 1945 and an M.S. in physics from the California Institute of Technology in 1948. He was associated with the Rand Corporation before becoming in 1961 the principal founder and director of the Hudson Institute, a research organization studying public policy issues, with headquarters in Croton-on-Hudson, N.Y. His international reputation as a strategic warfare analyst or, as the *New Republic* put it, one of "the prophets of strategic reality," is based on his work at the Institute and on his books: *On Thermonuclear War* (1960), *Thinking about the Unthinkable* (1962), *On Escalation* (1965 and, revised *Pelican*

STATEMENT OF E. P. WIGNER¹ FOR THE JOINT COMMITTEE ON DEFENSE PRODUCTION

¹Dr. Wigner is a Nobel Laureate and an emeritus professor of physics at Princeton University and has long been associated with civil defense issues. He edited a 1968 study *Who Speaks for Civil Defense?*

THE EFFECTIVENESS OF CIVIL DEFENSE

This writer became convinced of the possible effectiveness of civil defense measures when he served as a member of the General Advisory Committee to the U.S. Atomic Energy Commission.

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Are the U.S.S.R. and China the only countries with elaborate and well developed civil defense systems? No—most of the peace-loving countries also have such systems, based on blast shelters, and their yearly expenditures per person on such defense is about 15 times greater than ours. This has been, so far, about 40¢ per person a year. Incidentally, the Swiss civil defense repeats our President Kennedy's message: (Civil defense) "is insurance we trust, will never be needed"—its greatest accomplishment is, according to the Swiss, that it will *not* have to be used, that it will divert the aggressive instincts of possible opponents.

It is easy to conclude that an effective civil defense is not only desirable, it is also possible.

IS CIVIL DEFENSE NECESSARY?

What is the principal danger that threatens us in the present absence of an effective civil defense? It is the possibility of the U.S.S.R. evacuating its cities, dispersing their population, and then making demands on us, under the threat of a nuclear attack, approximating those made by Hitler or Czechoslovakia which led to the Munich pact. This left Czechoslovakia essentially defenseless.

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THE ARGUMENTS AGAINST CIVIL DEFENSE

The argument which we heard after the U.S.S.R. civil defense efforts became generally apparent was that our installation of protection for our people would only induce the U.S.S.R. to augment its aggressive capability. We now know that such augmentation took place even though we did not organize a vigorous civil defense effort. One of the two arguments we now hear, the civil defense is too expensive, seems almost ridiculous. If Switzerland, Sweden, etc., *even China*, can afford the more costly, the blast shelter method, we with the highest per capita national wealth, can also surely afford the defense of our people. The other argument, in the words of one of the most learned opponents of civil defense, S. Drell, is that it would lead to an "escalation of the apprehension from the mood of today, vis-a-vis the dangers of a nuclear exchange between the U.S. and the Soviet Union." Should the apprehension of the danger not be greater now, where we have no effective defense, than it would be when we have such defense? Or is it proposed that we should lull the common people into ignorance of the true situation? It is remarkable also that the U.S.S.R. is not criticised for fostering the "apprehension" of its own people. One must conclude that the varying arguments against civil defense have little validity.

A FEW PROPOSALS RELATED TO OUR DEFENSE

The first change I would advocate is to stop maintaining that a nuclear war would be the end of mankind. Such a statement may give the impression to an opponent that he can achieve anything by threatening with a nuclear war. After all, he would argue, the opponent (that is us) will make any sacrifice to avoid the "end of mankind". Hence, if he is threatened with extinction he will give in, particularly if the threat comes from a party which does not believe that the war precipitated by him will lead to the "end of mankind". Instead of such a blatantly incorrect statement, it would be better to subscribe to Chuykov's doctrine that "knowledge and the skillful use of modern protective measures" will make it possible to provide effective protection. At least, we could adhere to Kissinger's earlier (1957) statement: "While it (civil defense) cannot avert the traumatic effect of vast physical destruction, its efficient operation may make the difference between the survival of a society and its collapse."

The second measure which I consider to be urgent is to establish better contact with the people at large. This makes it desirable for DCPA to expand its staff by the employment of people who can establish a contact with the population at large, who can speak and write the truth convincingly. One of the functions of these advisors would be to help the high schools to give instruction on the nature of nuclear explosions and the defense against the effects of these. This is a subject which is foreign to most present high school teachers, and the advisor could and should help them to acquire the necessary knowledge. After all, the Federal Government now intends to support the local schools and can well suggest that these contribute to the protection of the country. The high school instruction on civil defense—obligatory in the U.S.S.R.—would be very useful since, after all, we learn best when we are young and we learn most non-elementary facts from our teachers. But even more generally, the establishment of a close contact between those who protect our freedom, and those whose freedom is protected, would be very desirable; and acquainting people at large with the methods and effectiveness of civil defense would provide an avenue toward this goal. It may not be easy to find people who know about the methods and effectiveness of civil defense and who are also able and interested in communicating this and much other knowledge to the people at large, but every effort should be made to find such people and support them.

The last suggestion I wish to make is that the DCPA budget should certainly not be cut. It should steadily be increased until, in a few years, it reaches the per capita level of other peace-loving and non-expansionist countries, such as Switzerland, Holland, Sweden, etc. For reasons given in the rest of my statement, this would be of decisive importance for maintaining a valid, widely endorsed, and vigorous defense effort for our country—and it would support all freedom-directed nations. Their independence does depend to a certain degree on our strength and our ability to stand up for them. The examples of Hungary, Czechoslovakia, Poland—to mention only a few—show that such independence does not come freely.

Let me end on a bit more hopeful tone which is, however, as sincere as was the rest of my statement. This is the hope that an effective civil defense may not only protect our country and our freedoms, but it may

also lead to a more true peace than the present one, which is based on the fear of destruction. I hope such a peace in which no rulers are tempted to increase their domains will come into being!

STATEMENT OF GERARD C. SMITH¹

I propose to discuss this morning some of the arms control implications of Vladivostok as well as certain related aspects of the current Defense budget submission.

I. THE VLADIVOSTOK ACCORD

At the start let me say that I put forward these ideas tentatively, not categorically. I question that anyone can speak with certainty about the slippery issues surrounding strategic arms and their control. I admit to a bias in favor of a very strong defense but I believe that arms control can also advance the security of the United States and the world whether or not there is some relaxation of tensions between the U.S. and the U.S.S.R.

The Vladivostok accord should not be judged in and of itself—but in connection with the limit on defensive systems (ABMs) agreed upon in 1972 and other American-Soviet agreements relating to arms control. It may help in judging the significance of Vladivostok to see that accord as part of a process that has been going on for more than five years. The general strategic dialog of the 1960s led to the specific SALT exchanges of 1969–72 at Helsinki, Vienna, Washington, and Moscow. Gradually the two sides developed somewhat better understanding of each other's strategic preoccupations. Concerns about accidental or miscalculated nuclear hostilities led to the first two SALT agreements in 1971—on measures to reduce the risk of outbreak of nuclear war and on measures to improve the Washington-Moscow direct communication link or "Hot Line." In 1972 there was the major breakthrough, the treaty limiting ABMs to two sites apiece, accompanied by the interim agreement to freeze offensive launches at the approximate levels of 1972. These were followed in 1973 by the Nixon-Brezhnev agreed principles for offensive arms limitation and in 1974 the ABM Treaty levels were reduced to one site apiece. At year's end the Vladivostok accord foreshadowed limitations on offensive systems which although of relatively short duration may be considered as a counterpart of the ABM Treaty. In judging this latest agreement one should consider the cumulative effect of the entire SALT process which hopefully can be considered as a preparatory stage for the natural next steps—reduction in offensive force levels which the sides are now committed to negotiate and some limitation on improvements in weapons characteristics. A total ban on ABM systems should also be reconsidered.

I would not favor interrupting the current Geneva negotiations by introducing a proposal for reductions. I do not believe that reductions are negotiable now. The Soviet position since 1968 has called for first a limitation and subsequently for reductions. When and if

¹ Mr. Smith is the former Director of the U.S. Arms Control and Disarmament Agency and chief U.S. representative in SALT I. He is now in private practice with the law firm of Wilmer, Cutler, and Pickering. His statement submitted to the Joint Committee was originally delivered to the Senate Foreign Relations Committee in April 1975.

(Gross exaggerations, assuming Nevada desert type terrain with no thermal shadows by city skylines, no duck and cover, no clothing and fraudulent blast effects data which ignores Hiroshima's evidence)

APPENDIX III

U.S. CIVILIAN NUCLEAR FATALITY ESTIMATES¹ FOR VARIOUS COUNTERFORCE ATTACK SCENARIOS

Type of attack	Assumptions	Estimated fatalities
Comprehensive attack:		
Case 1, 60 percent destruction of military targets.	1 optimum height of burst and 1 surface burst warhead per each of 1,054 ICBM silos; pattern attack of SAC bases; unspecified attack on 2 SSBN support bases; good shelter posture.	3, 200, 000
Case 2, 60 percent destruction of military targets.	2 optimum height of burst warheads per each of 1,054 ICBM silos; no pattern attack of SAC bases; unspecified attack on 2 SSBN support bases; poor shelter posture.	6, 700, 000
Case 3, 57-60 percent destruction of military targets.	2 surface burst warheads per each of 1,054 ICBM silos; pattern attack of SAC bases; unspecified attack on 2 SSBN support bases; very poor shelter posture.	16, 300, 000
ICBM only attack:		
Case 1.....	2 550 kt optimum height of burst warheads per each of 1,054 ICBM silos.	² 4, 000, 000
Case 2, 42 percent silo destruction.	1 550 kt surface burst and 1 550 kt optimum height of burst warhead per each of 1,054 ICBM silos.	5, 600, 000
Case 3, 80 percent silo destruction.	1 3 Mt surface burst and 1 3 Mt optimum height of burst warhead per each of 1,054 ICBM silos.	18, 300, 000
Case 4.....	2 3 Mt surface burst warheads per each of 1,054 ICBM silos.....	³ 20, 000, 000
Airlift attack:⁴		
Case 1.....	1 200 kt cruise missile warhead per each of 5 U.S. heavy airlift bases (Dover AFB, Del.; McGuire AFB, N.J.; Travis AFB, Calif.; Charleston AFB, S.C.; and McChord AFB, Wash.)	70, 000
Case 2.....	1 1.2 Mt SLBM per each of 5 U.S. heavy airlift bases.....	210, 000
Case 3.....	1 1.2 Mt SLBM per each of 5 U.S. heavy airlift bases uses offset targeting.	135, 000

¹ Department of Defense estimates as reported to the Senate Foreign Relations Committee, July 11, 1975, and published in "Analyses of Effects of Limited Nuclear War," pp. 12-24. Note that figures are fatalities only and not casualties and that attacks are restricted to military facilities (counterforce) rather than populated areas (countervalue). Shelter posture is a function of degree of hardening and the willingness of the population to use shelters.

² Under.

³ Circa.

⁴ Assumes allied victories in a European war supported by U.S. military airlift provide incentives for destruction of major American airlift centers.

Survival of the Relocated Population of the U.S. After a Nuclear Attack

FINAL REPORT • JUNE 1976 ORNL-5041

by

Carsten M. Haaland

Conrad V. Chester

Eugene P. Wigner

for

Defense Civil Preparedness Agency

Washington, D. C. 20301

OAK RIDGE NATIONAL LABORATORY

AD A 026362

SURVIVAL OF THE RELOCATED POPULATION
OF THE U.S. AFTER A NUCLEAR ATTACK

C. M. Haaland, C. V. Chester, and E. P. Wigner

ABSTRACT

The feasibility of continued survival after a hypothetical nuclear attack is evaluated for people relocated from high-risk areas during the crisis period before the attack. The attack consists of 6559 MT, of which 5951 MT are ground bursts, on military, industrial, and urban targets. Relocated people are assumed to be adequately protected from fallout radiation by shelters of various kinds. The major problems in the postattack situation will be the control of exposure to fallout radiation, and prevention of severe food shortages to several tens of millions of people. A reserve of several million additional dosimeters is recommended to provide control of radiation exposure. Written instructions should be provided with each on their use and the evaluation of the hazard. Adequate food reserve exists in the U.S. in the form of grain stocks, but a vigorous shipping program would have to be initiated within two or three weeks after the attack to avoid large scale starvation in some areas. If the attack occurred in June when crops on the average are the most vulnerable to fallout radiation, the crop yield could be reduced by about one-third to one-half, and the effects on crops of possible increased ultraviolet radiation resulting from ozone layer depletion by nuclear detonations may further increase the loss. About 80% of the U.S. crude refining capacity and nearly all oil pipelines would be either destroyed or inoperative during the first several weeks after an attack. However, a few billion gallons of diesel fuel and gasoline would survive in tank storage throughout the country, more than enough for trains and trucks to accomplish the grain shipments required for survival. Results of a computer program to minimize the ton-miles of shipments of grain between Business Economic Areas (BEAs) indicate that less than 2% of the 1970 rail shipping capacity, or less than 6% of the 1970 truck shipping capacity would be adequate to carry out the necessary grain shipments. The continuity of a strong federal government throughout the attack and postattack period is essential to coordinate the wide-scale interstate survival activities.

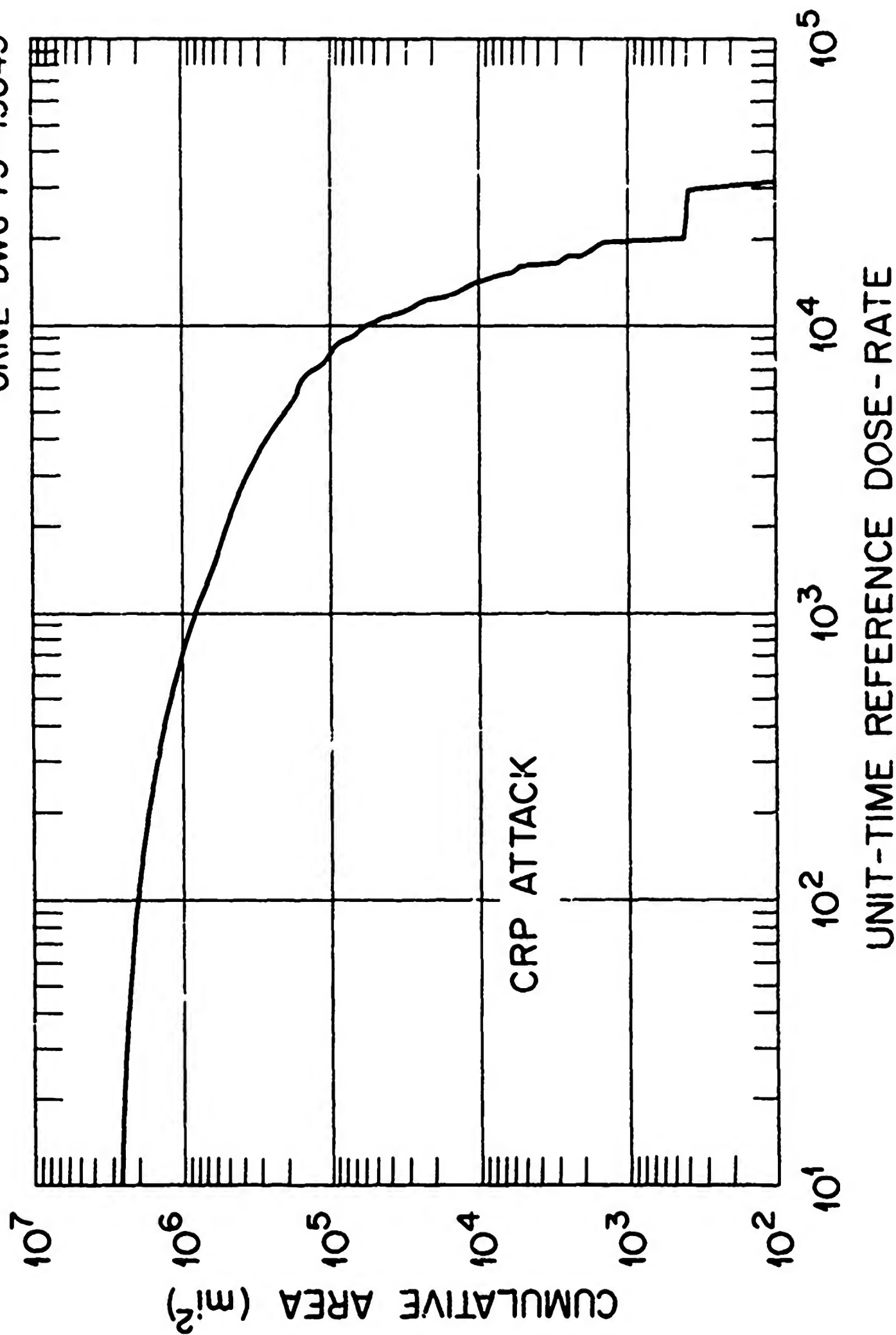
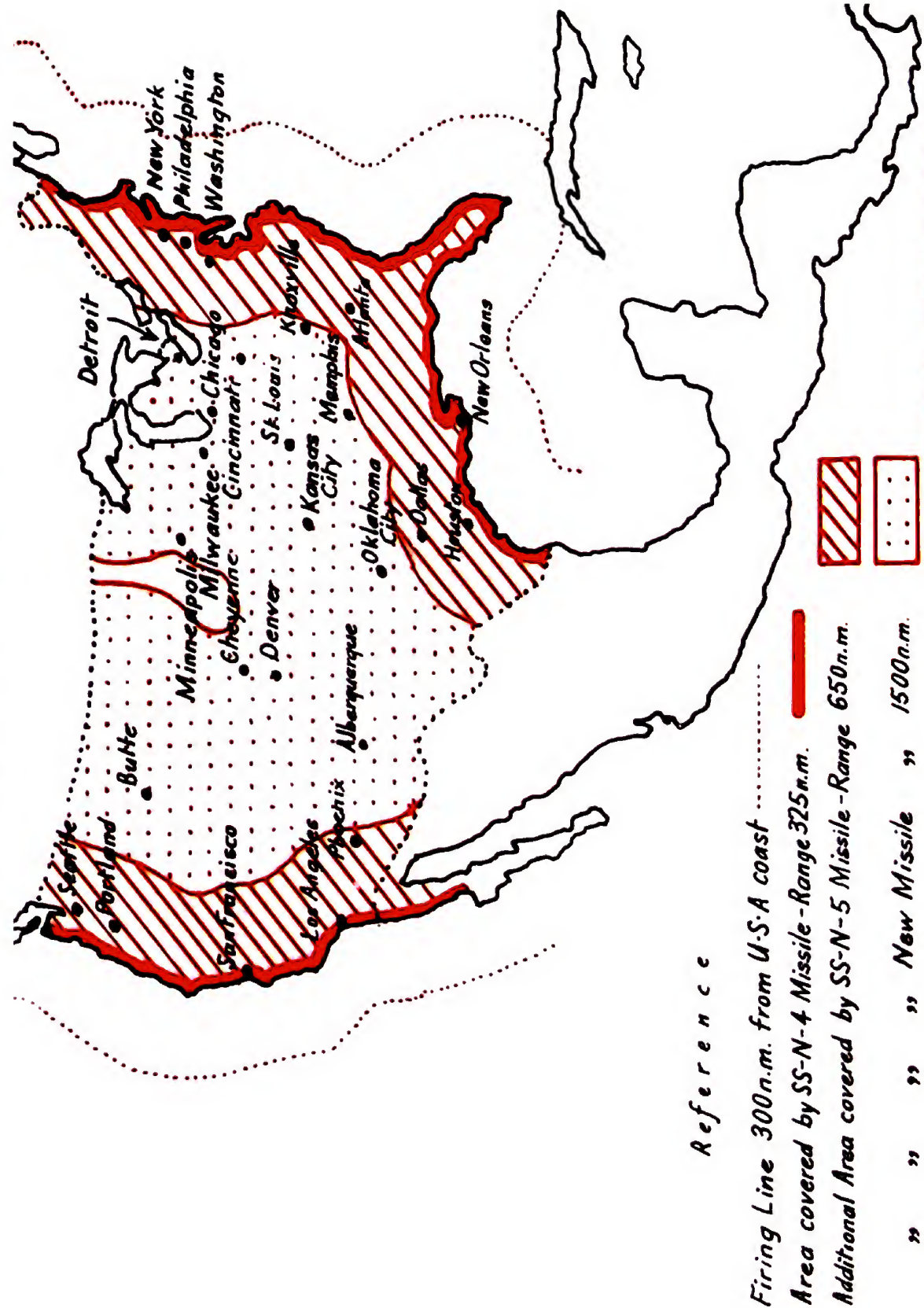


Fig. 4.2 Area of U.S. as a Function of Unit-Time Reference Dose-Rate.

TOP SECRET

SUBMARINE LAUNCHED BALLISTIC MISSILES

COVERAGE of the U.S.A



TOP SECRET

CABINET OFFICE WAR BOOK

CHAPTER 2

ACTION IN THE EVENT OF AN ATTACK WITHOUT WARNING

1. It would be possible for a potential enemy to launch a full-scale nuclear attack against this country without any readily detectable preparations. We might therefore (if there had been no period of tension to alert us) have very little time - possibly less than an hour - in which to prepare.
2. Beyond the instant alerting of the Air Defence System and any nuclear retaliation forces, it is not considered practicable to make any detailed plans for such a situation.
3. Immediate action required by the Cabinet Office is given below, and further action would be decided upon ad hoc at the time.

Cabinet Office Serial No.	Corresponding Government War Book Measure	Action to be taken	Observations
(a)	(b)	(c)	(d)
CAB.1	Appendix Z. Serials Z.3 and Z.4	<p><u>On receipt of information from Chief of the Air Staff that an attack on this country is imminent -</u></p> <p>SECRETARY -</p> <p>(a) Confirm with the Private Secretary to the Prime Minister where Cabinet meeting is to be held.</p> <p>(b) Inform the following of events and of the location of the meeting -</p> <p>(i) Foreign Secretary (ii) Home Secretary (iii) Secretary of State for Defence (iv) Chief of the Defence Staff</p>	The Chief of the Air Staff will have made necessary dispositions to avoid loss of aircraft on the ground by enemy action. He will also have informed the Prime Minister, Secretary of the Cabinet and the Chief of Defence Staff.
CAB.2	Appendix Z. Serial Z.5	<p>SECRETARY -</p> <p>Proceed immediately to meeting with Prime Minister and other Ministers and Chief of the Defence Staff</p>	At the meeting the Private Secretary to the Prime Minister will arrange for the latter to speak to the President of the United States.

IMPLEMENTATION OF GOVERNMENT WAR BOOK MEASURES

Cabinet Office War Book Serial No.	Corresponding Government War Book Measure	Action to be taken	Remarks
(1)	(2)	(3)	(4)
CAB. 3	-	<p><u>On receipt of any information which is considered by the Current Intelligence Groups to constitute a positive indication that an attack on this country is to be expected</u></p> <p>SECRETARY JOINT INTELLIGENCE COMMITTEE (JIC) -</p> <p>(a) Call immediate meeting of JIC, to which American and Canadian representatives are to be invited.</p> <p>(b) Warn -</p> <p>(i) Secretary of the Cabinet</p> <p>(ii) Defence Secretariat, Cabinet Office</p> <p>(iii) Secretary, Chiefs of Staff Committee (or, out of working hours, Defence Operations Centre Duty Officer, MOD)</p>	Intelligence procedure on receipt of a possible indicator is set out in detail in Chapter IV of the JIC Watch Manual (JIC(66) 6 (Final))
CAB. 4	Appendix Z Group A Serial 1.1	<p><u>If JIC agree that a nation of the Soviet bloc is about to engage in hostilities with this country -</u></p> <p>SECRETARY, JIC -</p> <p>Inform -</p> <p>(a) Private Secretary to the Prime Minister</p> <p>(b) Secretary of the Cabinet (and Defence Secretariat, Cabinet Office)</p> <p>(c) Home Secretary</p> <p>(d) Foreign Secretary</p> <p>(e) Secretary of State for Defence</p> <p>(f) Chief of the Defence Staff</p> <p>(g) United States and Canadian Intelligence Authorities</p> <p>(h) Standing Group and NATO Supreme Commanders, as appropriate</p>	<p>GSFS would, on receipt of this warning, arrange a secure speech and/or telegraph circuit between the Prime Minister and the President of the United States (see Serial CAB 14).</p> <p>SACEUR and SACLANT would in any event be informed</p>

October, 1966

Cabinet Office War Book Serial No.	Corres- ponding Government War Book Measure	Action to be taken	Remarks
(1)	(2)	(3)	(4)
CAB. 13	Part II Serial 1.9	<p><u>On receipt of notification from JIC that an attack is to be expected</u></p> <p>SECRETARY -</p> <p>summon a meeting of the Cabinet to which the Chiefs of Staff are invited.</p>	<p>Details of the whereabouts of Cabinet Ministers are in the Duty Officer's box</p>
CAB. 14	Part II Serial 1.10	<p><u>At the meeting of the Cabinet</u></p> <p>(a) SECRETARY -</p> <p>arrange for the Cabinet to consider -</p> <p>(i) whether the Precautionary Stage should be instituted;</p> <p>(ii) if so, whether decisions A.1 and A.2 or any other decisions in Part I should be authorised;</p> <p>(iii) whether a request from NATO Supreme Commanders to declare a Simple Alert should be approved;</p> <p>(iv) whether the United States and Commonwealth Governments and NATO should be informed of any decision to institute the Precautionary Stage.</p> <p>(b) remind the Cabinet -</p> <p>(v) that unobtrusive measures to improve the state of readiness of the Royal Air Force have been initiated;</p> <p>(vi)</p> <p>(vii) that the institution of the Precautionary Stage does not automatically bring into operation any further precautionary measures;</p>	<p>The Chiefs of Staff will be ready to make recommendations on the use of the nuclear retaliatory forces based on the United Kingdom.</p> <p>At an appropriate point in the meeting the Prime Minister may speak to the President of the United States, to discuss nuclear retaliation, emergency measures and the declaration of formal Alerts by NATO Supreme Commanders.</p>

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UK Joint Intelligence Committee, 1967

ANNEX A TO OOS 1929/2/11/67

PROBABLE NUCLEAR TARGETS IN THE UNITED KINGDOM: ASSUMPTIONS FOR PLANNING

Notes: (i) Figures in brackets denote total targets in each category; (ii) (A) denotes Air Burst; (iii) (S) denotes Surface Burst

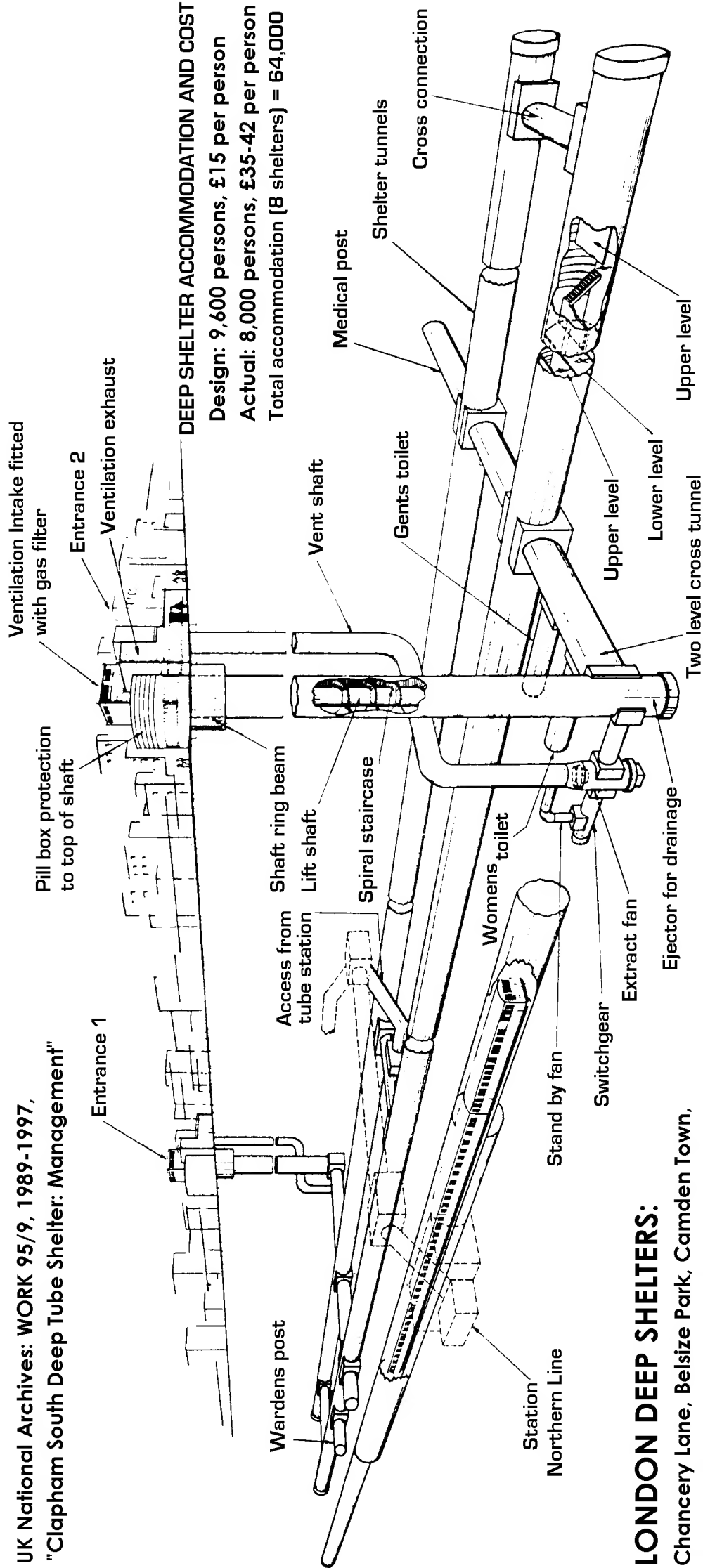
1. TARGETS RELATED TO ALLIED NUCLEAR STRIKE CAPABILITY (65)		Missile Weapon yield per target		Aircraft Weapon yield per target	
(a) CATEGORIES OF CONTROL ETC. (22)					
(1) Government - Central (2)					
- ex-Regional (12)					
London Cheltenham Caterick York Preston Cambridge Dover Reading Salcombe Brecon Kidderminster Ayr Edinburgh Nottingham	London	8 x 1 MT(A)	2 x 500 KT(A)		
	Cheltenham	2 x 1-1 MT(A)	2 x 500 KT(A)		
	Caterick	2 x 1-3 MT(S)	2 x 1 MT(S)		
	York	"	"		
	Preston	"	"		
	Cambridge	"	"		
	Dover	"	"		
	Reading	"	"		
	Salcombe	"	"		
	Brecon	"	"		
Northwood (HQ, CINCLAN/CINCPACFLTANT) Plymouth (HQ, COMCENTFLANT) Pitkeavie (HQ, COMFORLANT) Fort Southwick (HQ, C-in-C, UK Home Station) High Wycombe (HQ, Bomber Command) Ruislip (HQ, 3rd US Air Force) Bawtry (HQ, 1 Gp. Bomber Command)	Northwood (HQ, CINCLAN/CINCPACFLTANT)	2 x 1-1 MT(A)	2 x 1 MT(S)		
	Plymouth (HQ, COMCENTFLANT)	"	"		
	Pitkeavie (HQ, COMFORLANT)	"	"		
	Fort Southwick (HQ, C-in-C, UK Home Station)	2 x 1-3 MT(S)	2 x 1 MT(S)		
	High Wycombe (HQ, Bomber Command)	"	"		
	Ruislip (HQ, 3rd US Air Force)	"	"		
	Bawtry (HQ, 1 Gp. Bomber Command)	2 x 500 KT(A)	2 x 1 MT(S)		
	Scampton	"	"		
	Wittering	"	"		
	Waddington	"	"		
Scampton Wittering Waddington Hemington Cottesmore Marham Coningsby St. Margen Lossiemouth Macrihoush Leeming Gaydon Farnborough Valley Bedford Brackley Yeovilton Lynton Warton Pershore Boscombe Down Kinloss Manston Ballykelly Filton Leconfield	Scampton	"	"		
	Wittering	"	"		
	Waddington	"	"		
	Hemington	"	"		
	Cottesmore	"	"		
	Marham	"	"		
	Coningsby	"	"		
	St. Margen	"	"		
	Lossiemouth	"	"		
	Macrihoush	"	"		
Leeming Gaydon Farnborough Valley Bedford Brackley Yeovilton Lynton Warton Pershore Boscombe Down Kinloss Manston Ballykelly Filton Leconfield	Leeming	"	"		
	Gaydon	"	"		
	Farnborough	"	"		
	Valley	"	"		
	Bedford	"	"		
	Brackley	"	"		
	Yeovilton	"	"		
	Lynton	"	"		
	Warton	"	"		
	Pershore	"	"		

A-1

ANNEX A TO OOS 1929/2/11/67
(Continued)

1. ELEMENTS RELATED TO ALLIED NUCLEAR STRIKE CAPABILITY (65)		Missile Weapon yield per target		Aircraft Weapon yield per target	
(b) BOMBER BASES (including dispersed recovery and flight-refueling bases) (32) (Cont'd)		2 x 500 KT(Δ)		2 x 1 MT(S)	
(ii) USAF (6)		"		"	
Alconbury		"		"	
Barwaters		"		"	
Woodbridge		"		"	
Wethersfield		"		"	
Lakenheath		"		"	
Upper Heyford					
(c) BASES ETC. FOR SEABORNE NUCLEAR STRIKE FORCES (12)		2 x 500 KT(Δ)		2 x 1 MT(S)	
(1) Bases (5)		"		"	
Gareloch (Clyde)		2 x 500 KT(Δ)		2 x 1 MT(S)	
Holy Loch		"		"	
Rosyth (SSEW Refitting Base)		1 x 1-1 MT(Δ)		2 x 1 MT(S)	
Portsmouth		"		"	
Devonport		1 x 500 KT(Δ)		2 x 500 KT(Δ)	
(11) Communication Installations (7)		"		"	
VLF		"		"	
Rugby		"		"	
Orizaba		"		"	
Anthem (NATO)		"		"	
LF		"		"	
Inskip		"		"	
New Waltham		"		"	
Londonderry		"		"	
Thurso		"		"	
US Navy		4 x 1 MT(Δ)		2 x 500 KT(Δ)	
Glasgow		"		"	
Birmingham		"		"	
Liverpool		2 x 1 MT(Δ)		"	
Cardiff		"		"	
Manchester		"		"	
Southampton		"		"	
Leeds		"		"	
Newcastle		"		"	
Bristol		"		"	
Sheffield		"		"	
Swansea		"		"	
Hull		"		"	
Middlesbrough		"		"	
Coventry		"		"	
Wolverhampton		"		"	
Leicester		"		"	
Stoke-on-Trent		"		"	
Belfast		"		"	
Edinburgh		"		"	
Nottingham		"		"	
2. MAJOR CITIES (20)					

UK National Archives: WORK 95/9, 1989-1997,
 "Clapham South Deep Shelter: Management"



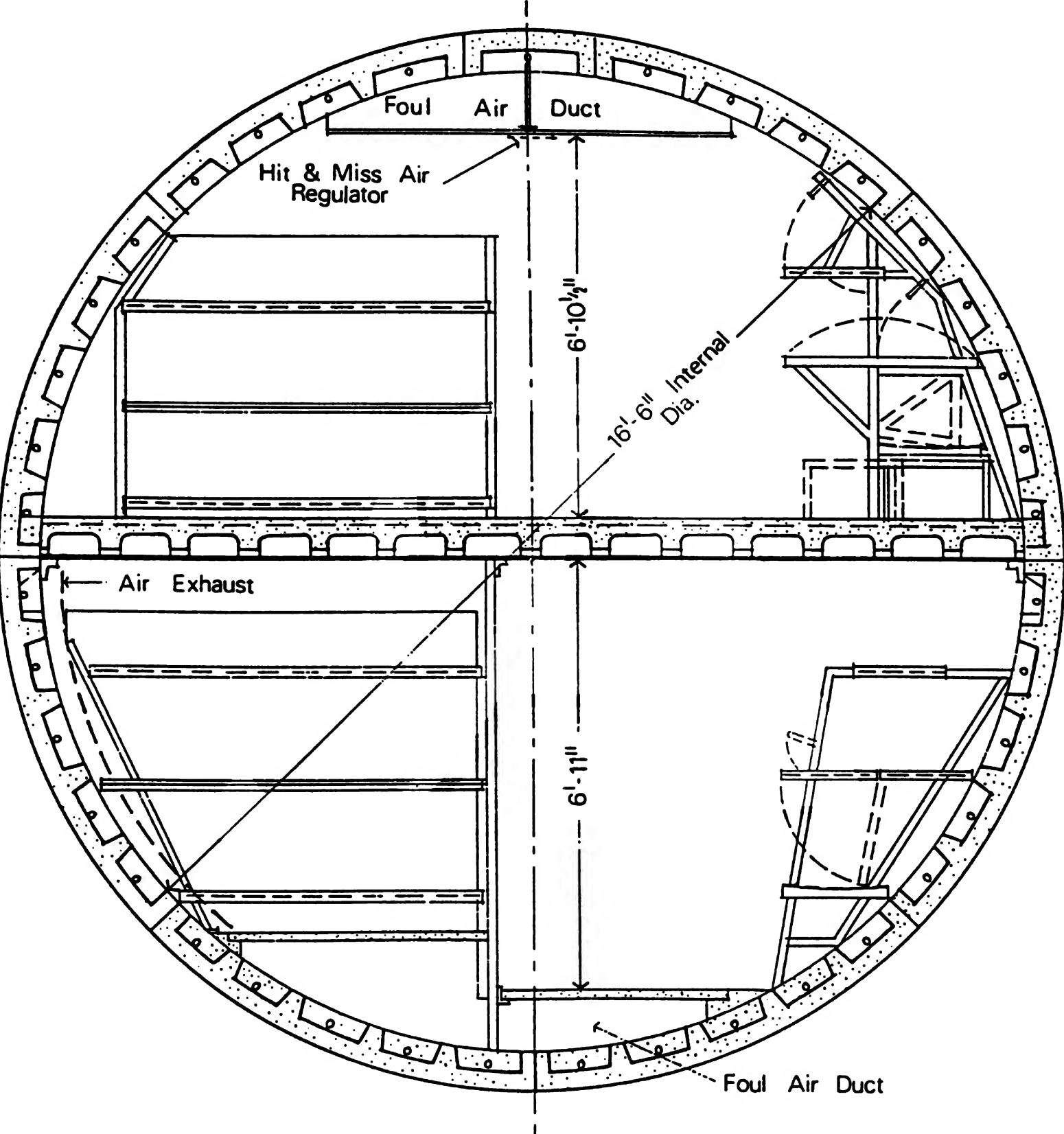
LONDON DEEP SHELTERS:

Chancery Lane, Belsize Park, Camden Town,
 Goodge Street, Stockwell, Clapham North,
 Clapham Common, Clapham South
 (government air raid shelters, built in 1940-2)
 Building began on 27 November 1940

Deep shelters were used by public from July 1944 after V1
 attacks began on 13 June 1944 (V2s began on 8 September)

DEEP SHELTER ACCOMMODATION AND COST
 Design: 9,600 persons, £15 per person
 Actual: 8,000 persons, £35-42 per person
 Total accommodation (8 shelters) = 64,000

FIG. 1
MOTT MAY AND ANDERSON
 CONSULTING ENGINEERS, LONDON



SECTION OF SHELTER TUNNEL

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3rd October, 1963.

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*J. G. A.
9/89*

For Pa

HOME OFFICE

HO 225/116

SCIENTIFIC ADVISER'S BRANCH

CD/SA 116

RESEARCH ON BLAST EFFECTS IN TUNNELS

With Special Reference to the Use of London Tubes as Shelter

by F. H. Pavry

Summary and Conclusions

The use of the London tube railways as shelter from nuclear weapons raises many problems, and considerable discussion of some aspects has taken place from time to time. But - until the results of the research here described were available - no one was able to say with any certainty whether the tubes would provide relatively safe shelter or not.

The more recent research here described showed for the first time that a person sheltering in a tube would be exposed to a blast pressure only about $\frac{1}{3}$ as great as he would be exposed to if he was above ground. (In addition, of course, he would be fully protected from fallout in the tube.)

Large-Scale Field Test ($\frac{1}{40}$) at Suffield, Alberta

The test is fully described in an A.W.R.E. report⁽⁶⁾. The decision of the Canadian Defence Research Board to explode very large amounts of high explosive provided a medium for a variety of target-response trials that was welcome at a time when nuclear tests in Australia were suspended. A.W.R.E. used the 100-ton explosion in 1961 to test, among other items, the model length of the London tube, at $\frac{1}{40}$ th scale, that had already been tested at $\frac{1}{117}$ scale.

Blast Entry from Stations

There was remarkable agreement with the $\frac{1}{117}$ th scale trials: "maximum overpressure in the train tunnels was of the order of $\frac{1}{3}$ rd the corresponding peak shock overpressure in the incident blast. The pressures in the stations were about $\frac{1}{6}$ th those in the corresponding incident blast".

(6) $\frac{1}{40}$ th Scale Experiment to Assess the Effect of Nuclear Blast on the London Underground System. A.W.R.E. Report E2/62.
(Official Use Only.)

100 ton TNT test on 1000 ft section of London Underground tube at Suffield, Alberta, 3 Aug 1961

Atomic Weapons Research Establishment, "1/40th Scale Experiment to Assess the Effect of Nuclear Blast on the London Underground System", Report AWRE-E2/62, 1962, Figure 30. (National Archives ES 3/57.)

200 FT FROM GROUND ZERO	400 FT FROM GROUND ZERO
100 PSI OUTSIDE	20 PSI OUTSIDE
30 PSI IN TUBES	7.2 PSI IN TUBES
15 PSI IN TUBE STATIONS	4.3 PSI IN TUBE STATIONS



Aldwych Underground tube station as Blitz shelter, 8 October 1940



Aldwych tube London 21 Oct 1940: effective Blitz air raid shelter



THOSE WHO WENT TO SHELTERS began a new kind of night-life. Some took over the Tubes, camping out in this fashion—Elephant and Castle Station, 11th November, 1940.



Tunnel shelters in hillside, very close to ground zero in Nagasaki, protected the occupants from blast, thermal radiation, and immediate nuclear radiation.

THE EFFECTS OF THE ATOMIC BOMBS AT HIROSHIMA AND NAGASAKI

REPORT OF THE BRITISH MISSION TO JAPAN

40. The provision of air raid shelters throughout Japan was much below European standards. Those along the verges of the wider streets in Hiroshima were comparatively well constructed : they were semi-sunk, about 20 ft. long, had wooden frames, and 1 ft. 6 ins. to 2 ft. of earth cover. One is shown in photograph 17. Exploding so high above them, the bomb damaged none of these shelters.

41. In Nagasaki there were no communal shelters except small caves dug in the hillsides. Here most householders had made their own backyard shelters, usually slit trenches or bolt holes covered with a foot or so of earth carried on rough poles and bamboos. These crude shelters, one of which is shown in photograph 18, nevertheless had considerable mass and flexibility, qualities which are valuable in giving protection from blast. Most of these shelters had their roofs forced in immediately below the explosion ; but the proportion so damaged had fallen to 50 per cent. at 300 yards from the centre of damage, and to zero at about $\frac{1}{2}$ mile.

42. These observations show that the standard British shelters would have performed well against a bomb of the same power exploded at such a height. Anderson shelters, properly erected and covered, would have given protection. Brick or concrete surface shelters with adequate reinforcement would have remained safe from collapse. The Morrison shelter is designed only to protect its occupants from the debris load of a house, and this it would have done. Deep shelters such as the refuge provided by the London Underground would have given complete protection.



Photo No. 17. HIROSHIMA. Typical, part below ground, earth-covered, timber framed shelter 300 yds. from the centre of damage, which is to the right. In common with similar but fully sunk shelters, none appeared to have been structurally damaged by the blast. Exposed woodwork was liable to "flashburn." Internal blast probably threw the occupants about, and gamma rays may have caused casualties.



Photo No. 18. NAGASAKI. Typical small earth-covered back yard shelter with crude wooden frame, less than 100 yds. from the centre of damage, which is to the right. There was a large number of such shelters, but whereas nearly all those as close as this one had their roofs forced in, only half were damaged at 300 yds., and practically none at half a mile from the centre of damage.

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**AIR MINISTRY
AP 3349**

**WO
CODE No.
9466**

26/GS Trg Publications/2329

**PRECAUTIONS
AGAINST
NUCLEAR ATTACK**

1957

(Superseding Precautions Against Atomic Attack, 1952 (WO Code No. 8769))

*Promulgated by Command of
the Army Council,*

*Promulgated by Command of
the Air Council,*

E. W. Playfair J. H. Barnes



Telegraph pole burnt on the side facing the flash. Note where foliage has acted as a shield



Shelter 100 yards from the centre of damage—Nagasaki

Protection against fall-out

101. Except in the immediate vicinity of a nuclear explosion a reasonably accurate prediction of the area of fall-out can be made in time for a warning to be issued to units in the areas in which it is likely to fall. Given a reasonable warning it may be possible to evacuate the area before the fall-out arrives. In any case simple precautionary measures can greatly reduce the hazard to life.

102. Exposure to the radio-active radiations from fall-out can be reduced by taking shelter and by using simple decontamination procedures until such time as persons can leave the area. In areas where radio-active contamination is heavy it may be necessary to remain under cover for as long as 48 hours before the radiations will have fallen, by natural decay, to levels at which it will be safe for persons to move about, either to leave the area, or, in the case of rescue teams from other areas, to enter it.

103. The estimated degree of protection against the residual radiation to be obtained from buildings, trenches, etc, in a fall-out area is shown at Table 7:—

TABLE 7. Estimated degree of protection against the residual radiation to be obtained from various buildings, trenches, etc, in a fall-out area

Type of building or shelter	INSIDE dose expressed as a fraction of the OUTSIDE dose
Slit trench with light board or corrugated iron overhead	$\frac{1}{2}$
Slit trench with 1 ft of earth overhead	$\frac{1}{100}$
Slit trench with 2 ft to 3 ft of earth overhead	$\frac{1}{200}$ to $\frac{1}{300}$
Nissen hut	$\frac{1}{2}$
One storey brick house	$\frac{1}{10}$ to $\frac{1}{20}$
Two storey brick house	$\frac{1}{10}$ to $\frac{1}{50}$
Three storey brick house	$\frac{1}{15}$ to $\frac{1}{100}$
	} dependent upon wall thickness and shielding afforded by neighbouring houses
Average two storey house in a built up area	$\frac{1}{40}$
Basements	$\frac{1}{200}$ to $\frac{1}{300}$
	} dependent upon shielding afforded by neighbouring houses

HOME OFFICE

SCIENTIFIC ADVISERS' BRANCH

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Mr Sheth

CD/SA 54

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SECRET

Some Aspects of Shelter and Evacuation Policy
to meet H-Bomb threat

1 Introduction

At the present time, with such air raid shelters as are at present in existence and allowing for the planned evacuation of the priority classes, the deaths from a single hydrogen bomb (assumed to have a power a thousand times that of the Nagasaki atomic bomb) on London would be nearly $2\frac{1}{2}$ million, and from five bombs, one each on London, Birmingham, Liverpool, Manchester and Glasgow over 6 million. The first object of Civil Defence must be to prepare a scheme to reduce this figure. No attempt is made in this note to plan such a scheme, but the effect on casualties of certain arbitrary shelter and evacuation measures is discussed in order to indicate the order of magnitude of the reduction which a properly worked out scheme might be expected to achieve.

2 Method of Estimating Deaths

The deaths from a nominal atomic bomb among a population of standard density (43.56 per acre) all in houses have been estimated (CDJPS(EA)(48)14 (Revised)) as 31,000. This is equivalent to everyone within 0.6 miles of the bomb being killed and no one being killed outside this radius. If the generally accepted sealing laws for blast heat and gamma radiation are assumed to apply to hydrogen bombs, then it will be sufficiently accurate for present purposes if we assume that for them everyone is killed within a radius of $0.6 \sqrt[3]{F}$ and no one is killed outside this radius. (Where F is the lower factor of the bomb expressed as a multiple of the lower of the nominal bomb). This assumption ignores the possibility that under certain circumstances there could be a large number of additional casualties due to fall out or radio-active crater debris.

From this and from the known night-time population distribution of our major cities (CD/SA 33), it is a simple matter to calculate the deaths from a bomb of any power on the centre of any particular city.

It must, however, be emphasised that the figures given in this note are deaths only. For the nominal atomic bomb it has usually been assumed that the injured are about equal in number to the killed. For the five hydrogen bombs considered in this note it is fairly certain that the killed would outnumber the injured due to the high population densities in the central (killed) areas as compared with the outer (injured) annuli. However, for the present, no attempt has been made to estimate the number of injured, but in considering the figures given in this note the existence of additional very large numbers of injured must be borne in mind.

3 Deaths with no shelter or evacuation

Table 1 shows the deaths that would result from a bomb with a power of 100CN, 500CN and 1000CN on the centre of each of our five largest cities with no shelter or evacuation.

(N = 20 kt)

Table 1

Deaths with no evacuation and no shelter

City	2 Mt	10 Mt	20 Mt
	Power of bombs		
	100N	500N	1000N
London	830,000	2,420,000	3,340,000
Birmingham	500,000	1,070,000	1,360,000
Glasgow	780,000	1,180,000	1,330,000
Liverpool	590,000	1,080,000	1,280,000
Manchester	560,000	1,070,000	1,350,000
Total	3,260,000	6,820,000	8,660,000

It will be seen that deaths from the five 1000N bombs total over 8.6 million.

5 x 20 Mt)

4 Effect of Shelter on deaths

Detailed designs of shelters required to give protection at specified distances from hydrogen bombs of various size, particularly if burst at ground level, have not been worked out. However it is of some interest to see what reduction in deaths would result from shelters of specified performance, even though it is uncertain just what strength and thickness would be required to give that performance. The simplest way of specifying shelter performance is by means of the "Safety Rating" concept developed in CD/SA 48. The safety rating of a shelter was there defined as the saving in life, expressed as a percentage of the deaths without shelter, resulting from the use of the shelter in an area of uniform population density. This shelter with a safety rating of 80 would save 80% of the lives that would have been lost if everyone had been in a house. Put in another way, shelter with a safety rating of 80 would reduce the area within which deaths occurred to one fifth of that for people in houses, and therefore the radius of death to $\frac{1}{\sqrt{5}}$. For a bomb with a power factor of F the equivalent radius of death if everyone is in a shelter with a safety rating of 80 will therefore be $\frac{0.6}{\sqrt{5}} \sqrt[3]{F}$. Similarly for shelter with a safety rating of 90 the radius will be $\frac{0.6}{\sqrt{10}} \sqrt[3]{F}$.

Although, as stated above, the design details of shelters to give these safety ratings have not been determined, it seems probable that surface or trench shelters of rather less than Grade A strength (say 1000 lb/sq.ft.) would be required to give a safety rating of 80, and that a strength of about 2000 lb/sq.ft. would be required for a safety rating of 90. For small street surface shelters the extra cost of an increase in strength of this sort is very small (e.g. the structural cost of a 12"/1000 lb/sq.ft. design is given in CD/SA 48 as £15.2 per person, based on seated capacity) and of a 12"/1400 lb/sq.ft. design as £15.5 per person) and detailed studies may well show that shelters with a higher safety rating than 90 are a practical proposition.

From the formulae for equivalent radii of death given above, and from the population distribution given in CD/SA 33 we can calculate the expected deaths in these two types of shelter under the same conditions of attack as were given in Table 1 for a population all in houses. The results are given in Tables 2 and 3.

Table 2

Deaths with no evacuation but with everyone
in a shelter with a Safety Rating of 80

City	2 Mt	10 Mt	20 Mt
	Power of bomb		
	100N	500N	1000N
London	135,000	474,000	785,000
Birmingham	129,000	353,000	484,000
Glasgow	223,000	576,000	760,000
Liverpool	159,000	401,000	565,000
Manchester	117,000	386,000	540,000
Total	763,000	2,190,000	3,134,000

(N = 20 kt)

Table 3

Deaths with no evacuation but with everyone
in a shelter with a Safety Rating of 90

City	2 Mt	10 Mt	20 Mt
	Power of bomb		
	100N	500N	1000N
London	59,000	216,000	367,000
Birmingham	64,000	191,000	296,000
Glasgow	115,000	327,000	489,000
Liverpool	78,000	238,000	340,000
Manchester	49,000	186,000	315,000
Total	365,000	1,158,000	1,807,000

The considerations discussed above strongly suggest that the right policy against the hydrogen bomb would be to evacuate the central areas of our larger cities and to provide shelter where it is most useful, i.e. in the annulus surrounding the central evacuation area.

In the meantime, however, it is of some interest to examine the effect on casualties of an arbitrary evacuation area of radius 5 miles in the case of London and 3 miles in the case of Birmingham, Glasgow, Liverpool and Manchester, in conjunction with shelter having a safety rating of 80 and 90 in the surrounding annulus. In each case the evacuees from the central area are assumed to be accommodated in the surrounding annulus, arbitrarily taken as between 5 and 15 miles in the case of London and between 3 and 7 miles in the case of the other four cities. The factors by which this evacuation would increase the population density in the 'reception' annulus are as follows; London 1.5, Birmingham 1.6, Glasgow 2.5, Liverpool 1.9 and Manchester 1.7. The deaths resulting from an attack with 1000N bombs after this scheme had been implemented are shown in Tables 4 and 5.

Table 4

Deaths from 1000N bombs after evacuation of 5 mile radius circle for London and 3 mile radius for other cities. Evacuees assumed accommodated in surrounding annulus where they and the original inhabitants are provided with shelter having a safety rating of 80.

20 Mt

City	Position of bomb		
	Central	2 miles from centre	In position to cause maximum deaths
London	0	0	518,000
Birmingham	0	159,000	256,000
Glasgow	0	171,000	247,000
Liverpool	0	174,000	247,000
Manchester	0	164,000	257,000
Total	0	668,000	1,525,000

Table 5

Deaths from 1000N bombs after evacuation of 5 mile radius circle for London and 3 mile radius for other cities. Evacuees assumed accommodated in surrounding annulus where they and the original inhabitants are provided with shelter with a safety rating of 90.

20 Mt

City	Position of bomb		
	Central	2 miles from centre	In position to cause maximum deaths
London	0	0	261,000
Birmingham	0	56,000	155,000
Glasgow	0	64,000	152,000
Liverpool	0	67,000	152,000
Manchester	0	62,000	151,000
Total	0	249,000	671,000

It will be seen from Tables 4 and 5 that, with this scheme of total evacuation of a central area and shelter in the surrounding annulus, a central bomb causes no deaths at all. Clearly, however, the enemy would be aware of our provisions and might well choose to drop his bombs where they would cause maximum casualties. On average, and without allowing for local concentrations which would be bound to occur in the "reception annulus", this would be at about 7 miles from the centre in the case of London and about 4 miles for the other cities. The average deaths from bombs in these worst positions are therefore given in Tables 4 and 5. Comparing these figures with those to Table 1 it will be seen that evacuation plus shelter with a safety rating of 80 has reduced deaths by 82%, and plus shelter with a safety rating of 90 by 90%.

Conclusion

Without shelter or evacuation, the deaths from an attack with only five hydrogen bombs might total over $8\frac{1}{2}$ million. The primary object of Civil Defence must be to reduce this figure. Neither evacuation alone nor shelter alone could reduce these deaths to a manageable proportion, but with a suitable combination of the two, consisting of the total evacuation of the population of the central areas into the surrounding annuli where shelter would be provided, it should be possible to reduce the maximum deaths from this particular attack to something of the order of one million.

April, 1954.

E.L.W. **E. L. W. = Edward Leader-Williams**
OSA.41/4/32. **(who in WWII tested the Morrison shelter**
 while John Fleetwood Baker's colleague)

REFERENCES:

CD/SA 48 = Nat. Archives HO 225/48,
"The safety-cost relationship for certain
types of surface and trench shelters"

CD/SA 72 = Nat. Archives HO 225/72,
"Casualty estimates for ground burst 10
megaton bombs"

The circulation of this paper has been strictly limited.

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TOP SECRET

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I.R.(50) 7

29TH NOVEMBER, 1950.

MINISTRY OF DEFENCE

IMPORTS RESEARCH COMMITTEE

EXAMINATION OF PROBLEM IN PERIOD OF TENSION

Note by the Chairman.

The Chiefs of Staff recently considered⁺ a report by the Imports Research Committee of the Ministry of Defence on the steps that might be taken to reduce the threat of the clandestine use of atomic weapons against this country.

2. This report concluded that:

- (1) the following are the most likely forms in which a clandestine attack could take place, in order of likelihood:
 - (a) concealing a complete atomic bomb in the hold of a merchant ship coming from a Soviet or satellite country;
 - (b) disguising an atomic bomb by breaking it down into a number of parts and making them up as merchandise; this could be done on any merchant ship but more easily and safely on one coming from a Soviet or satellite country;
 - (c) the detonation of an atomic bomb in a "suicide" aircraft flying low over a key point.
- (2) there are no practicable and efficacious steps that can be taken in peace time to prepare against any of these threats.

+ C.O.S.(50) 181st: 4

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11. We understand that an interdepartmental committee is considering a Ports Emergency Anchorage Scheme primarily for use in war-time in case major ports were rendered unusable by enemy action but that the dislocation it would cause to merchant shipping would be so great as to make it quite impracticable to adopt any such method of discharge in peace time, even if it were only applied to ships from a limited number of countries.

Detonation in a Civil Aircraft (Method (c))

12. Method (c) mentioned in paragraph 3 above - the use of a civil aircraft carrying an atomic bomb to be exploded at a low altitude - we do not consider so likely as the use of a merchant ship; nevertheless it is possible and there does not seem to be any answer to it. The crew of the aircraft in order to detonate the bomb at the right time would have to know what their cargo was and would therefore be a suicide squad. Short of firing on every strange civil aircraft that appears over our shores we know of no way of preventing an aircraft that sets out on such a mission from succeeding.

A Possible Deterrent

13. It follows from the above that there is a real risk of attack in the way described in our terms of reference; and that the only effective way of dealing with the most likely method of attack - namely a procedure for trans-shipping all cargoes from Soviet or satellite countries before they reach our shores - would be quite impracticable in peace time.

14. We consider however that there is a real possibility of deterring potential enemies from making an attack of this kind merely by a sufficient show of confidence that we have methods of dealing with it. Any claim to have found a scientific method of detecting an atomic bomb would be easily seen through and would be valueless as a deterrent. But a confident assurance that we know all about the problem and can deal with it might, we believe, mystify our enemy and help to dissuade him from taking so fateful a step. It may also be possible for the London Controlling Section to organise deceptive activities which, without indicating precisely how we should set about it, would support such an assertion; and we suggest that the Section should be invited to examine the problem in the light of this report.

15. The recent parliamentary questions (answered on Wednesday, 18th October) on this subject to the Minister of Defence offered an opportunity for giving the required assurance. The Minister of Defence said in his reply

"His Majesty's Government are fully aware of this danger. It will be appreciated, however, that our assessment of the risks and the exact nature of our plans for meeting them would be of the greatest interest to a potential enemy and cannot be disclosed. We are aware of the recent action taken by the U.S. authorities and are in touch with them on the general question of defence against atomic attack".

PRIME MINISTER

Clandestine Use of Atomic Weapons

The Chiefs of Staff have been considering the possibility that the enemy might open the next war with an atomic attack on London on the model of the Japanese attack on Pearl Harbour - without warning and before any formal declaration of hostilities. The most effective method of making such an attack would be to drop an atomic bomb from a military aircraft. If the control and reporting system were fully manned and alert in a period of tension, there would be some chance that hostile aircraft approaching this country could be intercepted and driven off. At any rate, there are no special measures, outside the normal measures of air defence, which we could take in peace-time to guard against this type of attack.

2. It is, however, possible that the enemy might use other means of surprise attack with atomic weapons. A clandestine attack could be made in either of the following ways:-

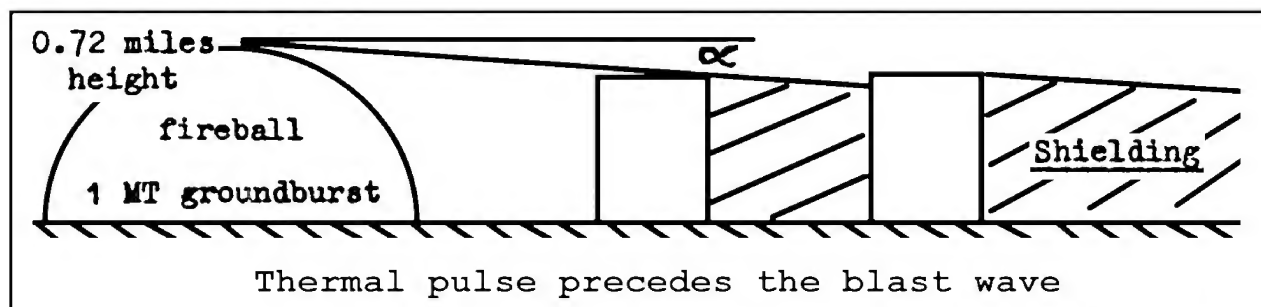
- (i) A complete atomic bomb could be concealed in the hold of a merchant ship coming from the Soviet Union or a satellite country to a port in the United Kingdom:
- (ii) An atomic bomb might be broken down into a number of parts and introduced into this country in about fifty small packages of moderate weight. None of these packages could be detected by instruments as containing anything dangerous or explosive, and even visual inspection of the contents of the packages would not make identification certain. These packages could be introduced either as ordinary merchandise from Soviet ships, or possibly as diplomatic freight. The bomb could subsequently be assembled in any premises with the sort of equipment usual in a small garage, provided that a small team of skilled fitters was available to do the job.

SCIENTIFIC ADVISER'S BRANCH

(Paper at Tripartite Thermal Effects Symposium, Dorking, October 1964)

IGNITION AND FIRE SPREAD IN URBAN AREAS
FOLLOWING A NUCLEAR ATTACK

G. R. Stanbury

INITIAL FIRE INCIDENCE

Assuming that buildings on opposite sides of a street which is receiving heat radiation from a direction perpendicular to its length are of the same height we take the average depth of a floor to be 10 ft.

Effect of Shielding: Estimation of the number of exposed floors

Distance from explosion miles	Angle of arrival α°	Width of street (units of 10 ft.)						
		2	3	4	5	6	7	8
3	$13\frac{1}{2}$	.5	.5	1	1	1.5	1.5	2
4	10	.5	.5	.5	1	1	1.5	1.5
5	8	.5	.5	.5	.5	1	1	1

SPREAD OF FIRE

From last war experience of mass fire raids in Germany it was concluded that the overall spread factor was about 2; i.e. about twice as many buildings were destroyed by fire as were actually set alight by incendiary bombs

Number of fires started per square mile in the fire-storm raid on Hamburg, 27th/28th July, 1943

102 tons H.B.	48 tons, 4 lb. magnesium	40 tons, 30 lb. gel.
100 fires	27,000 bombs	3,000 bombs
	8,000 on buildings	900 on buildings
	1,600 fires	800 fires
2,500 fires in 6,000 buildings		

However, the important thing to note is that the total number of fires started in each square mile (2,500) was nearly half that of the total number of buildings; in other words, almost every other building was set on fire

When the figure of 1 in 2 for the German fire storms is compared with the figures for initial fire incidence of ~ 1 in 15 to 30 obtained in the Birmingham and Liverpool studies it can only be concluded that a nuclear explosion could not possibly produce a fire storm.

SECONDARY FIRES FROM BLAST DAMAGE IN LONDON

Fire situation from 1,499 fly bombs in the built-up part of the London Region

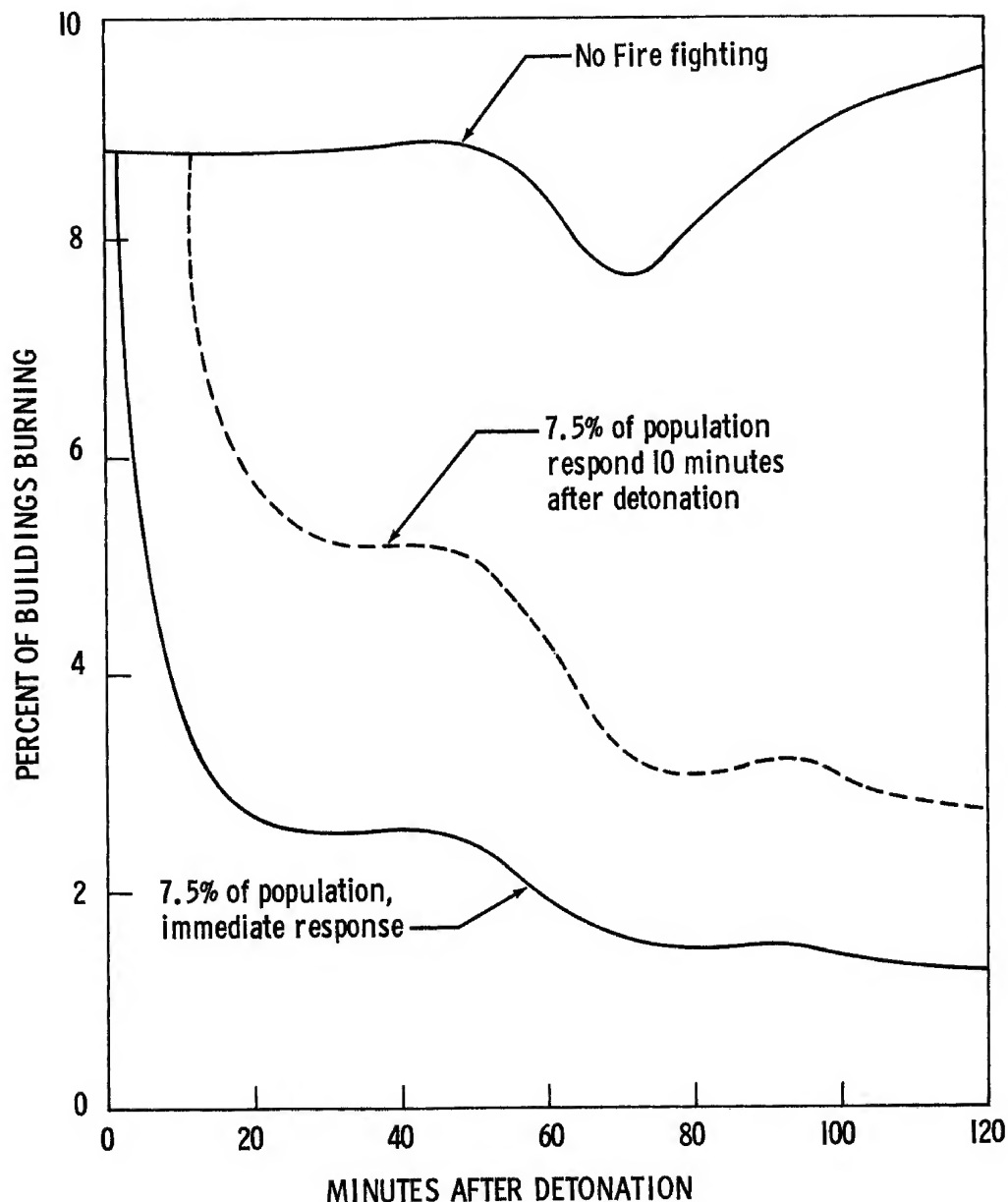
(Fires from 1 ton TNT V1 cruise missiles, 1944)

	Number of fly bombs	Fly Bombs Caused				
		No fire	Small fire	Medium fire	Serious fire	Major fire
Grand Totals	1,499	804	609	75	7	4

The large proportion started no fires at all even in the most heavily built-up areas.

All these fly bombs fell in the summer months of 1944 which were unusually dry. In winter in this country in residential areas there are many open fires which may provide extra sources of ignition. The domestic occupancy is a low fire risk however, and as the proportion of such property in the important City and West End areas is small this should not introduce any serious error. Moreover, in winter, the high atmospheric humidity and the correspondingly high moisture content of timber would tend to retard or even prevent the growth of fire.

Takata, A.N., Mathematical Modeling of Fire Defenses, IITRI, March 1970, AD 705 388.



OFFICE OF THE AIR SURGEON

NP-3041

MEDICAL EFFECTS OF ATOMIC BOMBS

**The Report of the Joint Commission for
the Investigation of the Effects of the
Atomic Bomb in Japan; Volume VI**

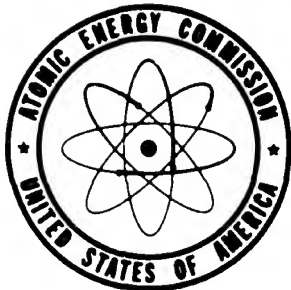
By

Ashley W. Oughterson	Henry L. Barnett
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Averill A. Liebow	B. Aubrey Schneider
E. Cuyler Hammond	

July 6, 1951

[TIS Issuance Date]

Army Institute of Pathology



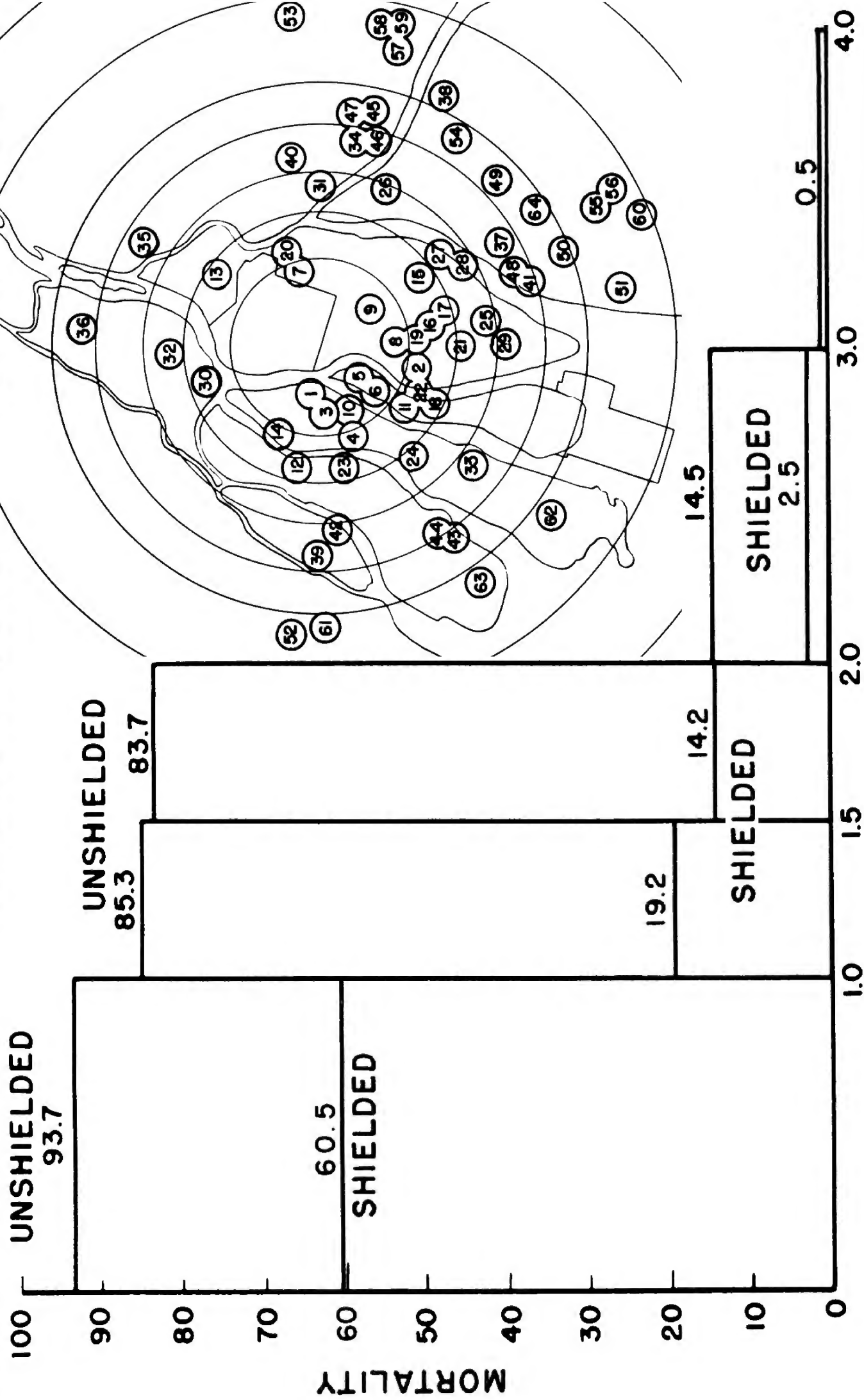
UNITED STATES ATOMIC ENERGY COMMISSION
Technical Information Service, Oak Ridge, Tennessee

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HIROSHIMA
SCHOOL CHILDRENWORK PARTIES
DISTRIBUTION

Percent



DISTANCE (Kilometers)



PROTECTION AGAINST RADIANT HEAT. *This patient (photographed by Japanese 2 October 1945) was about 6,500 feet from ground zero when the rays struck him from the left. His cap was sufficient to protect the top of his head against flash burns.* (Lethal 6.7 cal/sq cm, according to the 1979 US Office of Technology Assessment "Effects of Nuclear War")

HIROSHIMA



1 HB-8

The house at Main and Elm Streets. Two typical colonial two-story center hall frame dwellings were placed at 3,500 and 7,500 feet from the bomb tower. (FCDA—Operation Doorstep—Yucca Flat, Nev., Mar. 17, 1953.)



X-19

This mannequin can only stay in the position in which he was placed, staring through the window at coming disaster. A real occupant of this house could prepare—and survive. (FCDA—Operation Doorstep—Yucca Flat, Nev., Mar. 17, 1953.)



1 HA-11

House No. 1, from the camera tower from which the dramatic collapse pictures were taken. The Post Office truck to the left, although it lost all windows and suffered body damage, was driven away later, as was the car in the rear of the house. Entry to the basement was made through the corner at lower center. (FCDA—Operation Doorstep—Yucca Flat, Nev., Mar. 17, 1953.)



LSA-2

3,500 feet from ground zero. The house overhead is totally destroyed, some of it has fallen into the basement, but the mannequin in the lean-to shelter is undisturbed. The photo was taken from ground level, looking into the basement through the gap between the basement wall and the broken floor timbers. (FCDA—Operation Doorstep—Yucca Flat, Nev., Mar. 17, 1953.)



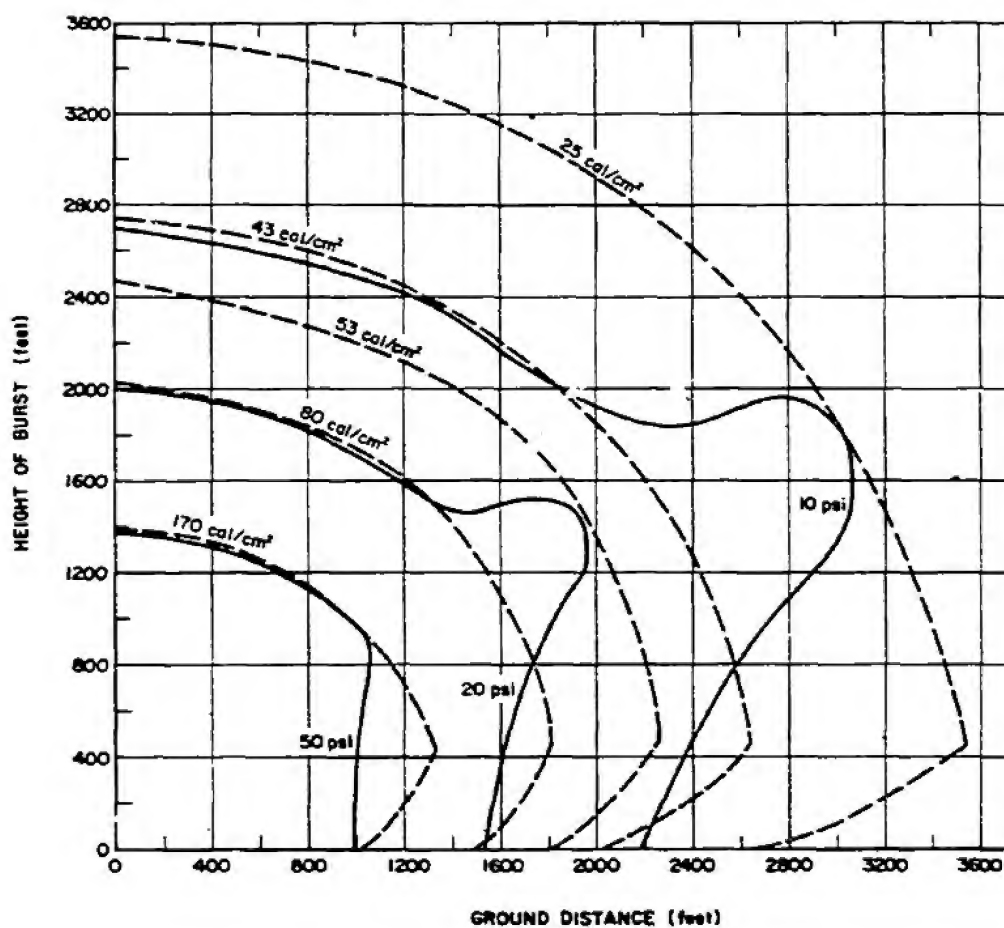


Figure 3-43. Free Field Radiant Exposure and Air Blast Overpressure at the Surface, as a Function of Height of Burst and Ground Distance, for 10 kilotons, 16 Mile Visual Range, High Overpressure Region

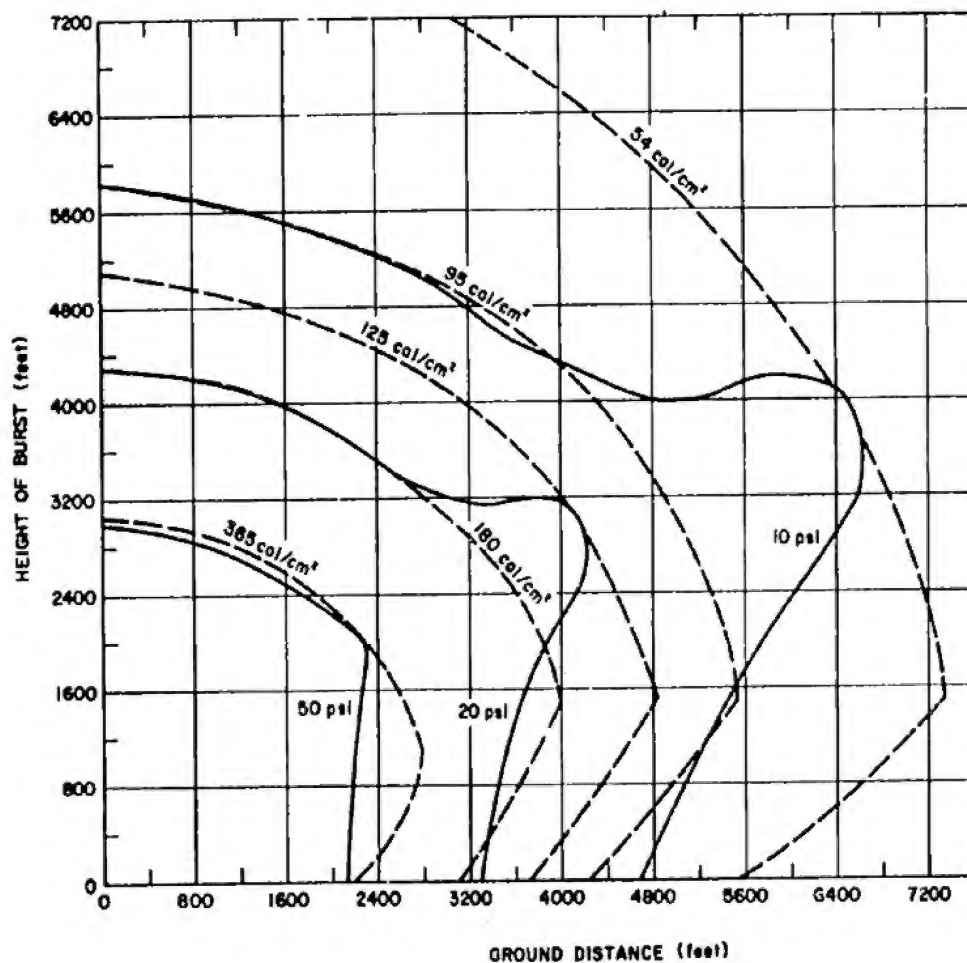
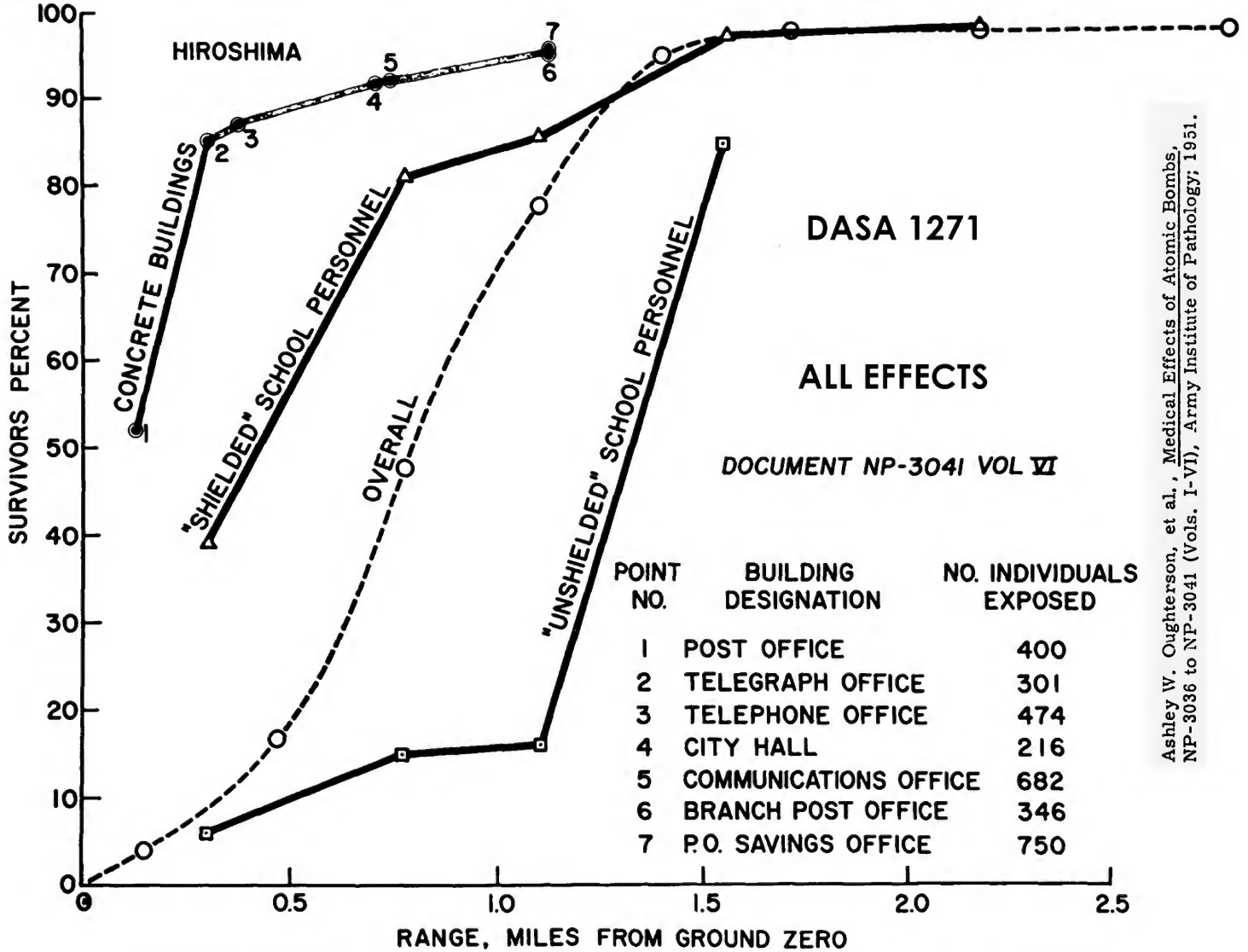
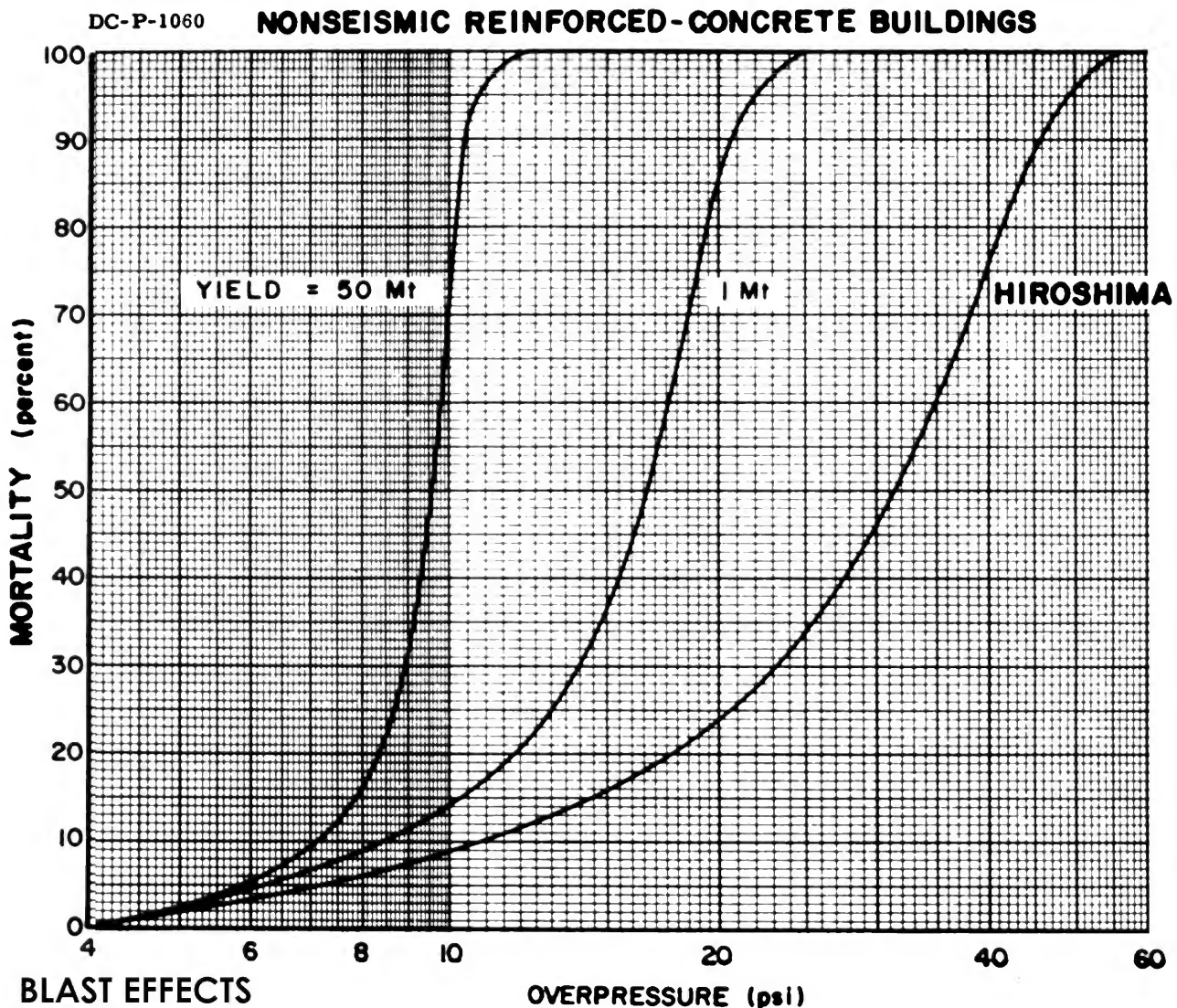


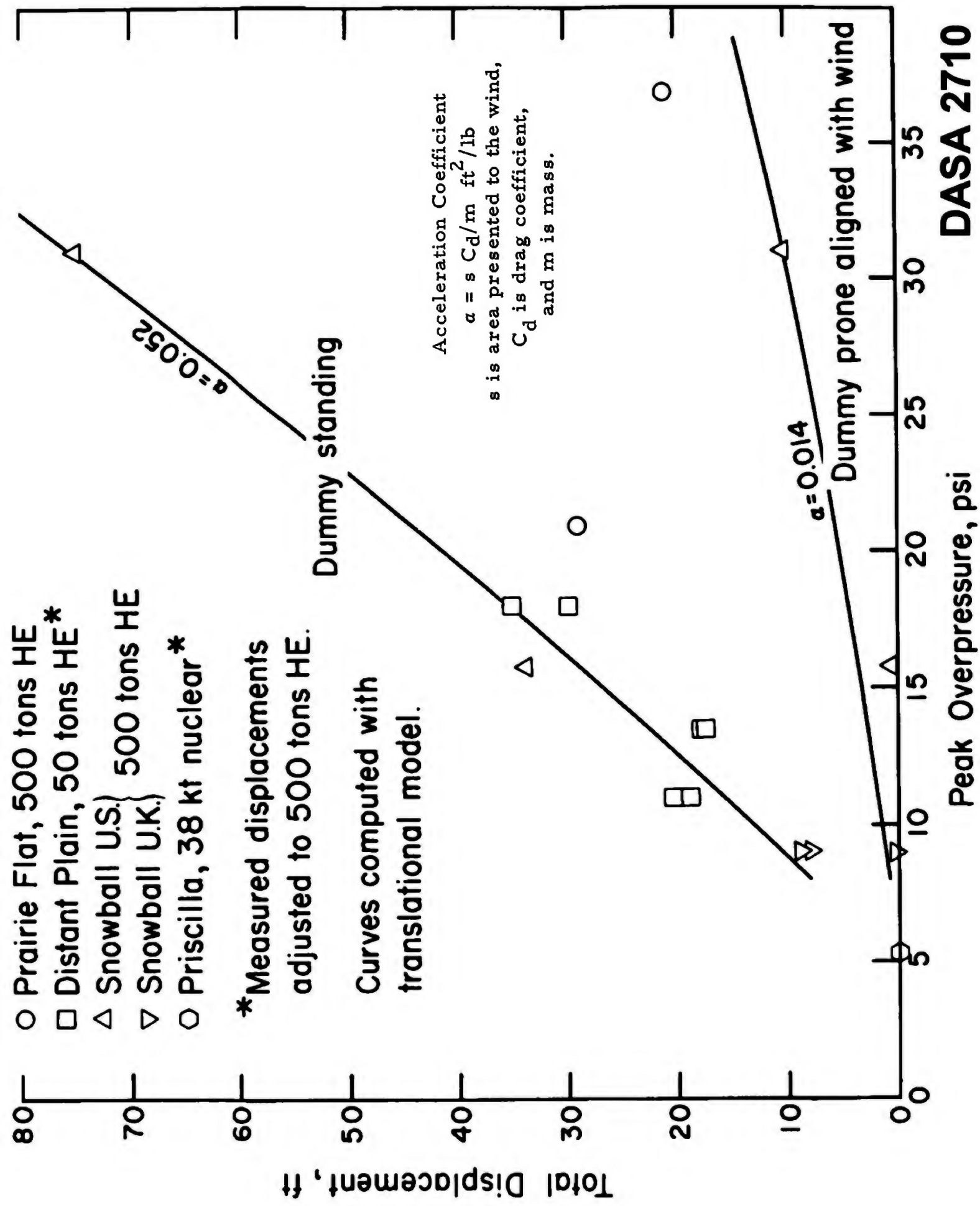
Figure 3-47. Free Field Radiant Exposure and Air Blast Overpressure at the Surface, as a Function of Height of Burst and Ground Distance, for 100 kilotons, 16 Mile Visual Range, High Overpressure Region



Ashley W. Oughterson, et al., Medical Effects of Atomic Bombs, NP-3036 to NP-3041 (Vols. I-VI), Army Institute of Pathology; 1951.

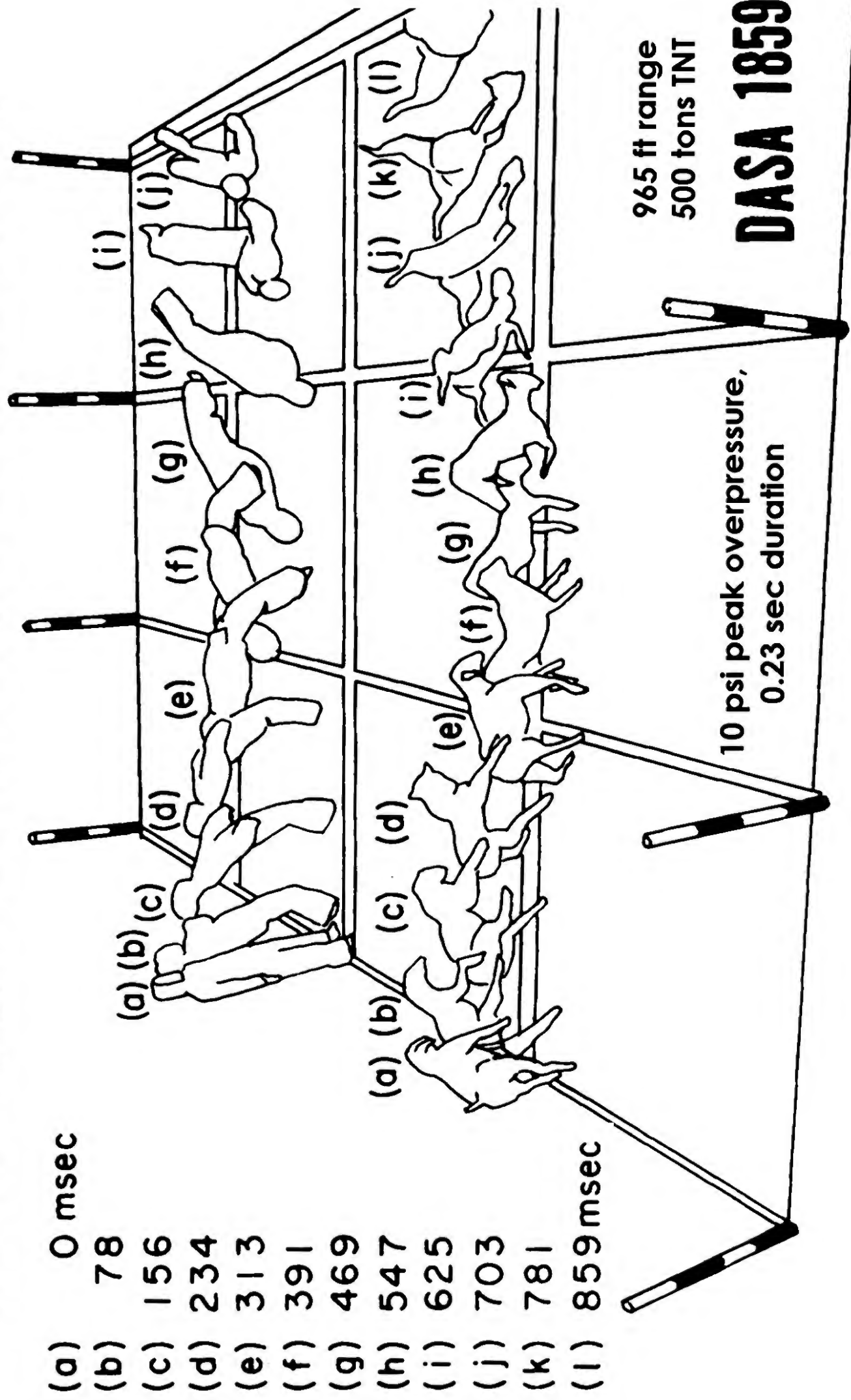


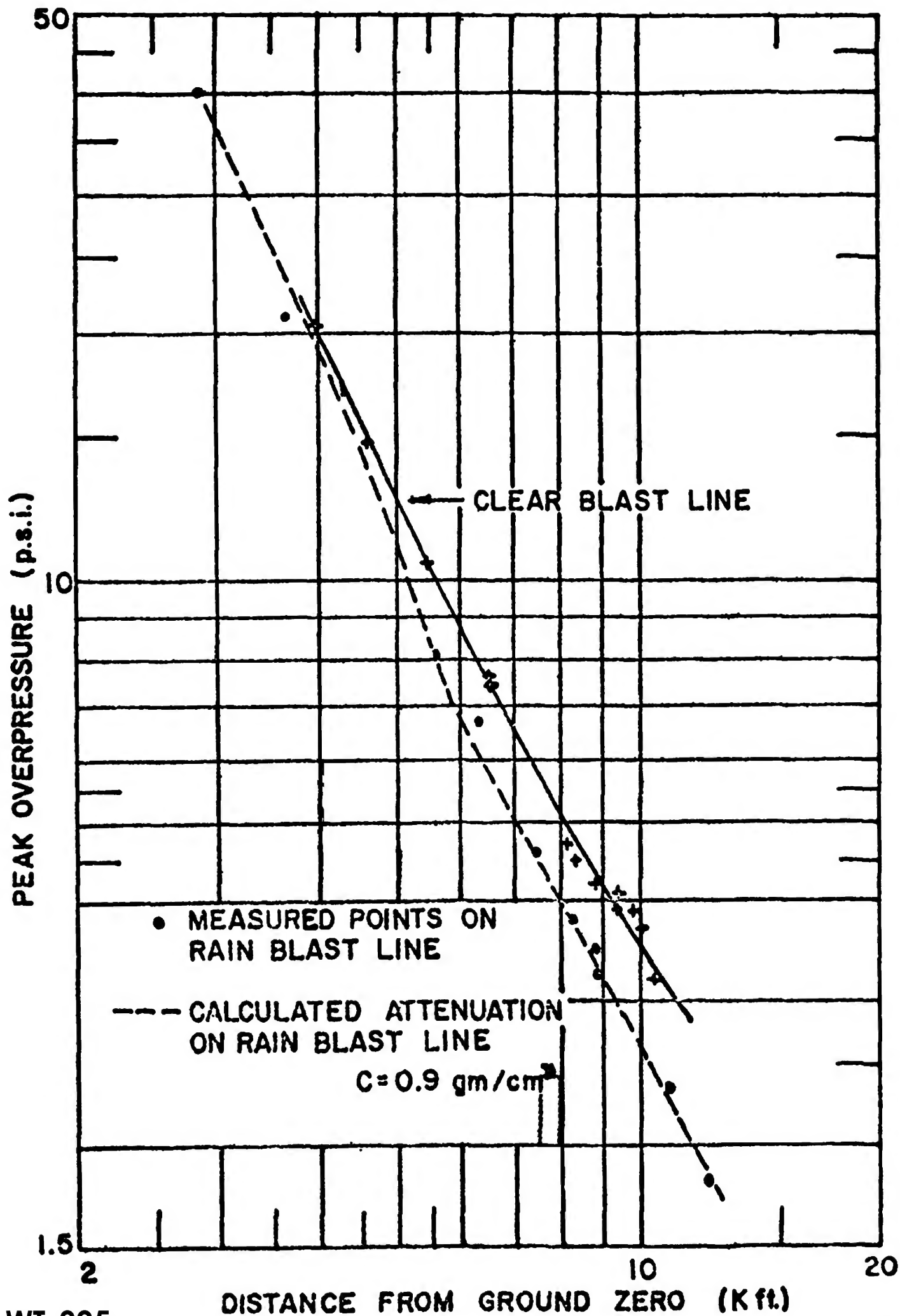
L. Wayne Davis, Donald L. Summers, William L. Baker, and James A. Keller, Prediction of Urban Casualties and the Medical Load from a High-Yield Nuclear Burst, DC-FR-1060, The Dikewood Corporation



Operation Snowball, station 10SB, comparison of human dummy with standing goat (proxy)
peak velocity of initially standing 165 lb dummy = 33.7 ft/sec with 20 ft total displacement

(A U.K. dummy lying prone at 9 psi peak overpressure was unmoved in this test)





WT-905:

effect of
rainfall

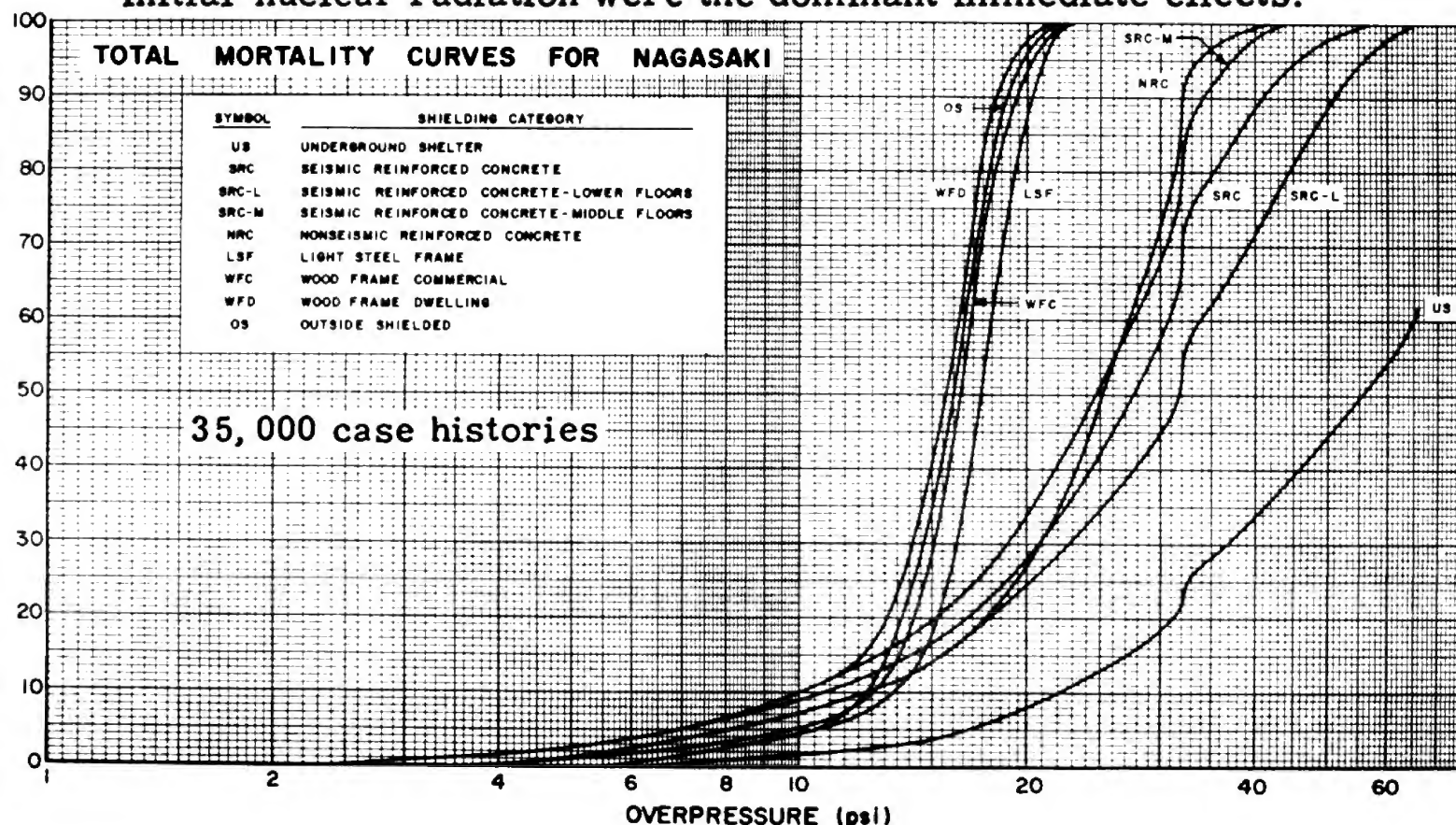
Figure 4.4

Comparison of measured and calculated
attenuation of pressure, Shot 3.

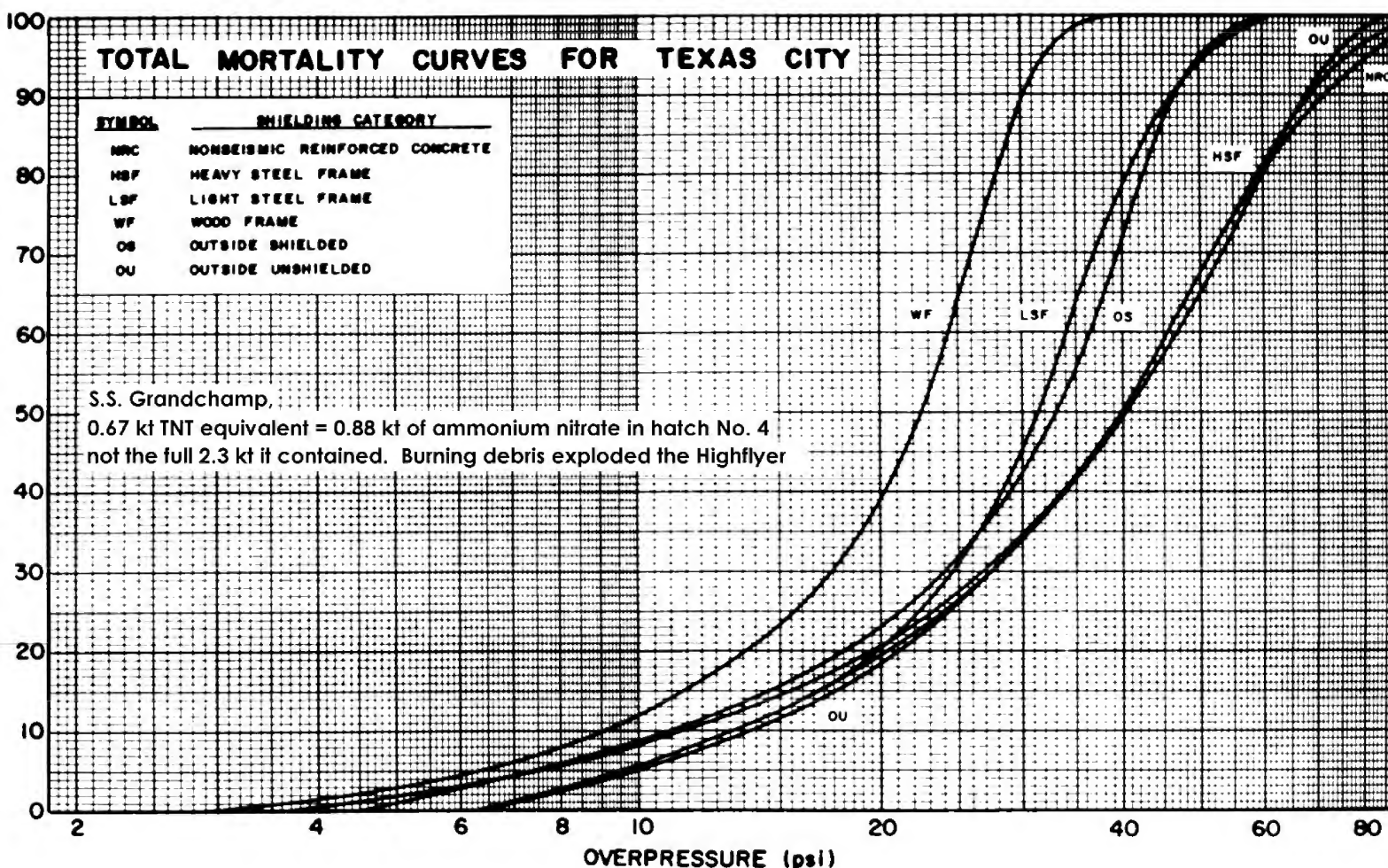
110 kt
Castle
Koon

L. Wayne Davis, Donald L. Summers, William L. Baker, and James A. Keller, Prediction of Urban Casualties and the Medical Load from a High-Yield Nuclear Burst, DC-FR-1060, The Dikewood Corporation

For people in or shielded by structures in Japan, the blast and initial-nuclear radiation were the dominant immediate effects.

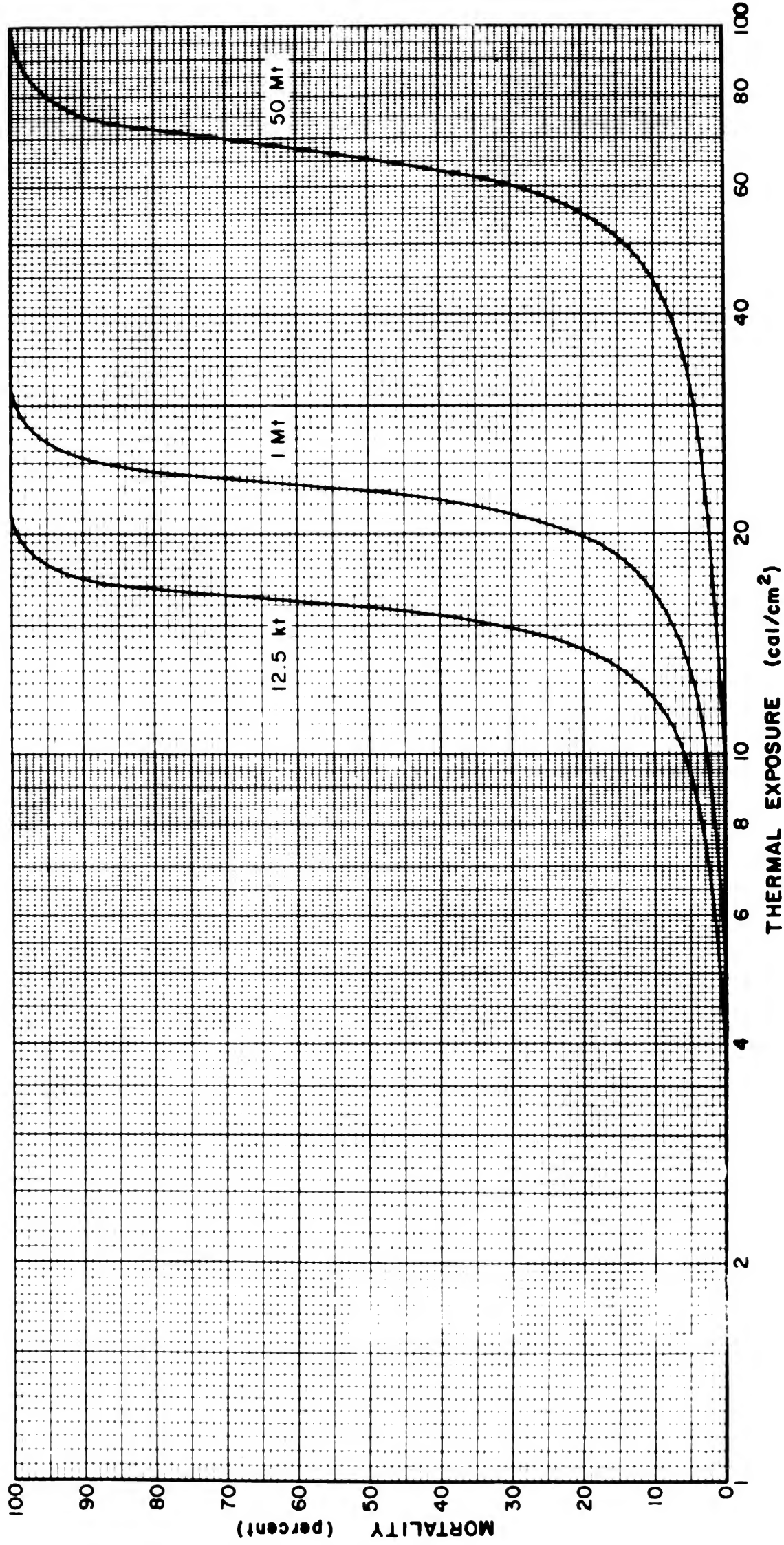


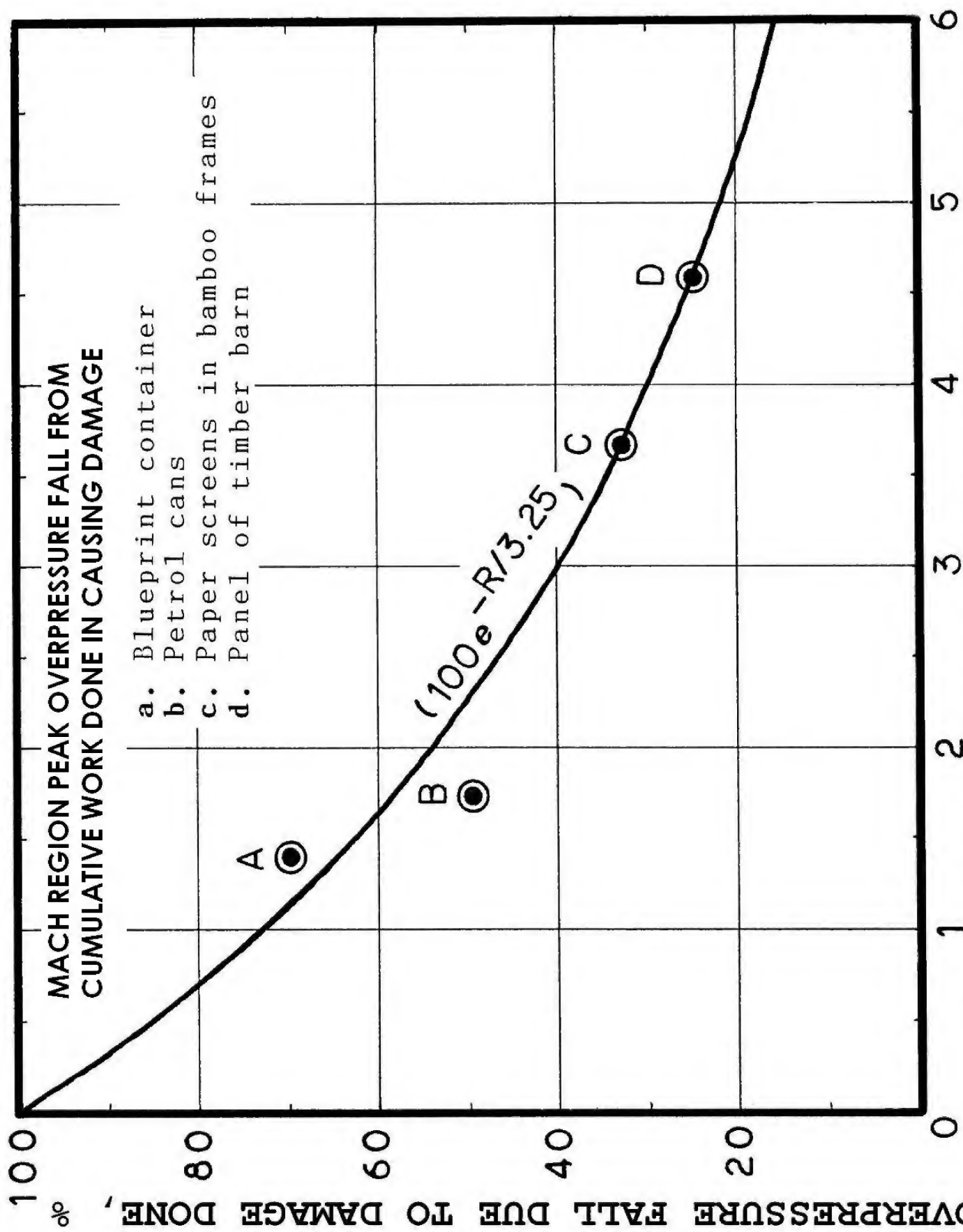
S.S. Grandchamp at Texas City exploded in 1947. It contained 2.3 kt of ammonium nitrate in 100-lb paper bags, but only the 0.88 kt in No. 4 hatch was tamped and exploded after catching fire. TNT equivalent was 0.67 kt.



PROMPT-THERMAL MORTALITY CURVES FROM SURFACE BURSTS FOR OUTSIDE-UNSHIELDED PERSONS

[Data based on Hiroshima assuming 12.5 kt yield. For the 2002 revised 16 kt yield in DS02, thermal exposures must be increased by 28%]





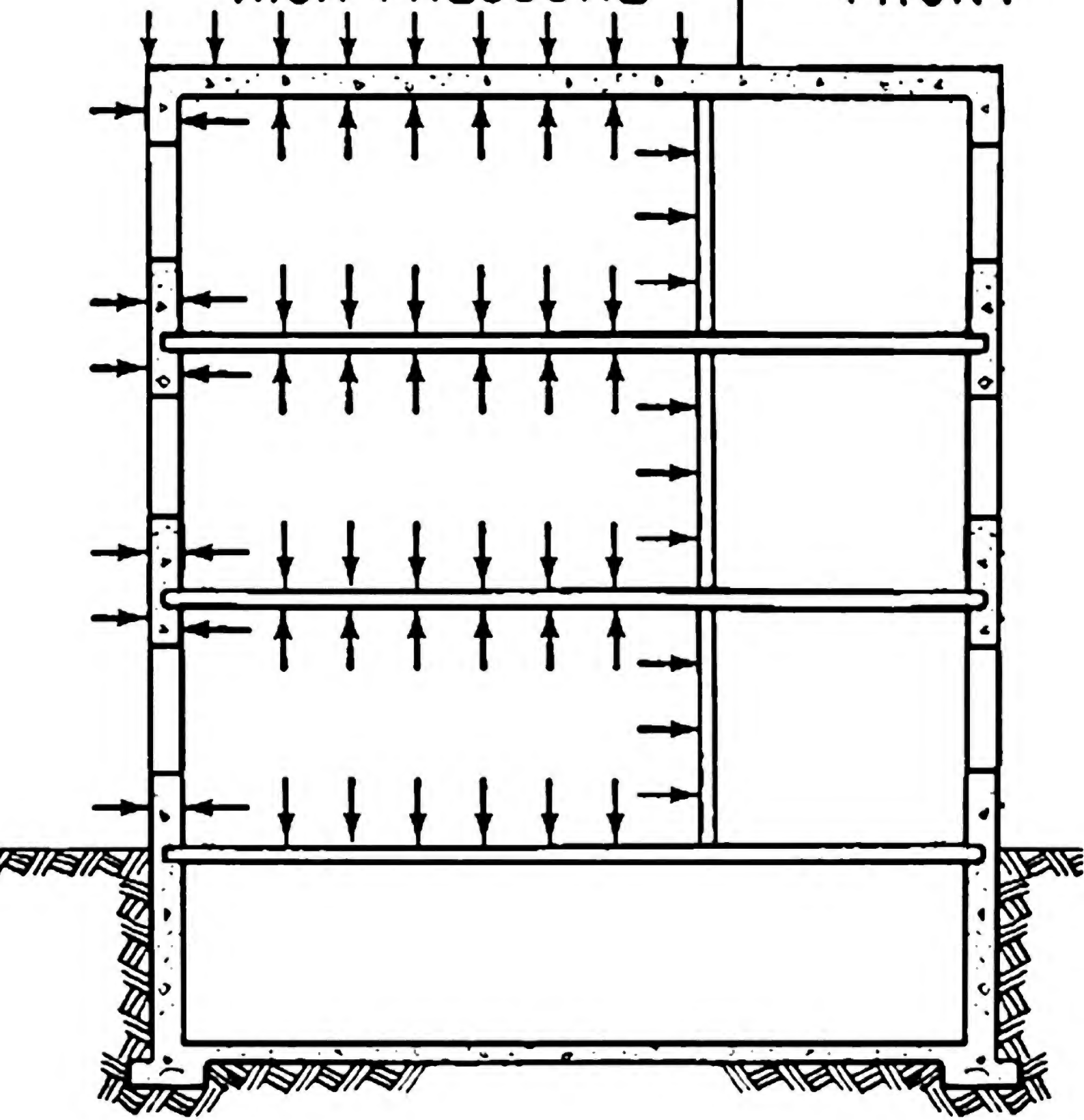
DISTANCE FROM HIROSHIMA GROUND ZERO, KM

Data from Dr W. G. Penney, et al., 'The Nuclear Explosive Yields at Hiroshima and Nagasaki', Phil. Trans. Roy. Soc., v266 (1970), pp. 357-424.

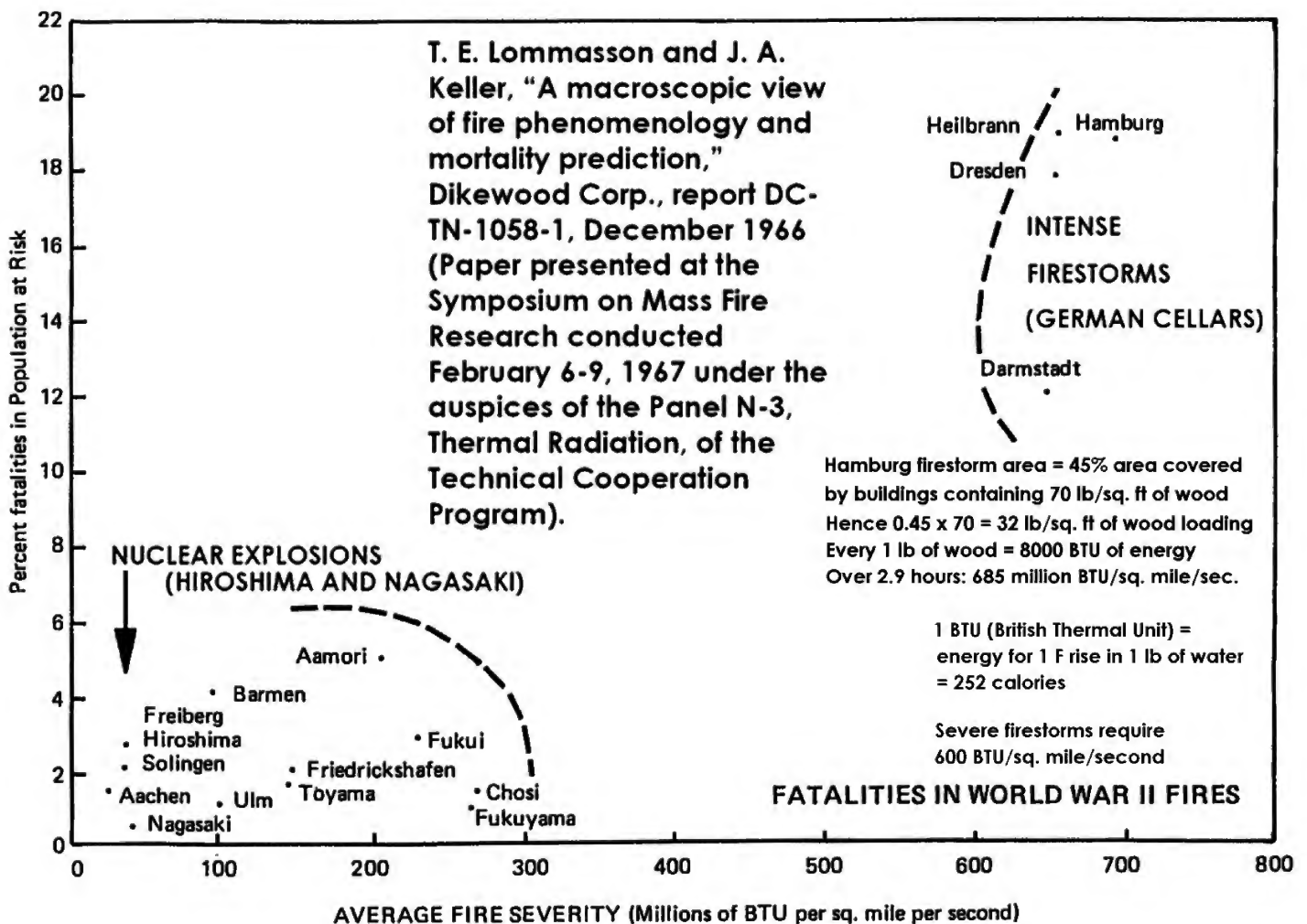
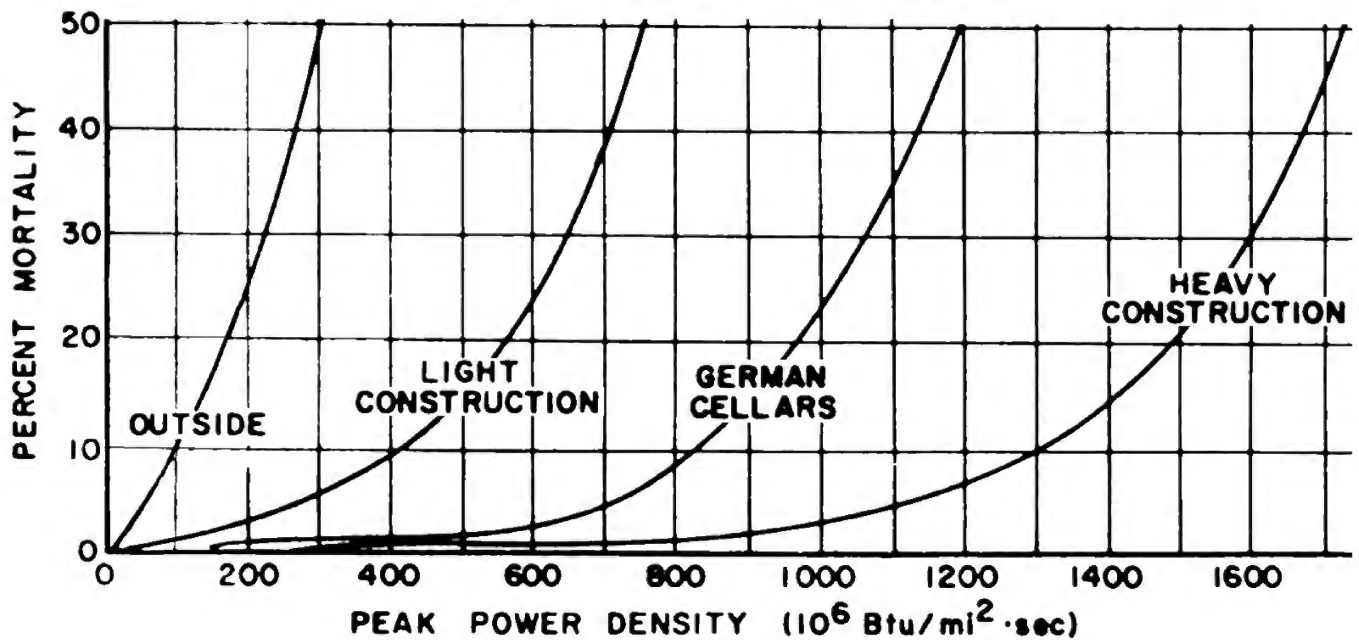
Rapid equalization of inside and outside pressure for large window areas

REGION OF HIGH PRESSURE

SHOCK FRONT



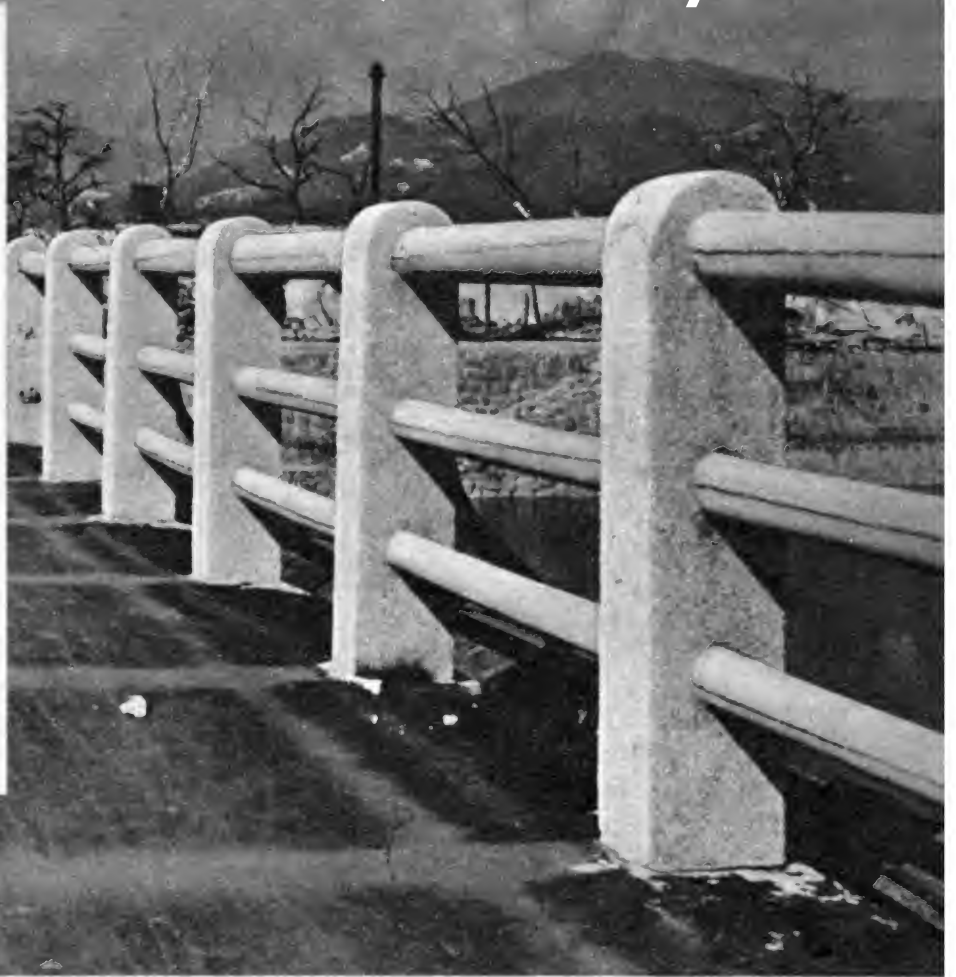
FIRE MORTALITY CURVES



Lommasson and Keller, **A Macroscopic View of Fire Phenomenology and Mortality Predictions**, Dikewood Corporation, DC-TN-1058-1, December 1966.

J. A. Keller, **A Study of World War II German Fire Fatalities**, DC-TN-1050-3, The Dikewood Corporation; April, 1966.

R. Schubert, **Examination of Building Density and Fire Loading in the Districts Eimsbuettel and Hammerbrook of the City of Hamburg in the Year 1943** (20 volumes, in German), Stanford Research Institute; January, 1966.



Hiroshima railing, above, protected the area immediately behind it from flash burns. So, if you're in the open country when an A-bomb is dropped, take cover behind nearest tree, insert.

Well-built concrete structure, below, remained standing in Hiroshima amid rubble of trailer buildings. So, if you're in the city streets when bomb falls, take cover in nearest building, insert.



The U. S. Strategic Bombing Survey No. 5 undertaken by the U. S. Air Force, states flatly: "The most instructive fact at Nagasaki was the survival of the few hundred people who were properly placed in tunnel shelters. Without question, shelters can protect those who get to them against anything but a direct hit."

The best protection from shock, radiation and heat is reinforced concrete; almost as good is closely packed earth. The thickness required to protect you fully depends, obviously, on the distance from the blast. How much protection and at what distances? Well many other factors influence the effect of an atomic blast, including height of the burst, direction of the blast and types of buildings in its path. The government handbook, *The Effects of Atomic Weapons*, estimates that at a half-mile from the explosion, a 12-inch reinforced concrete wall inside a building would provide enough protection.



Target area at Hiroshima was completely leveled except for a few reinforced concrete building frames. That's why American builders of A-bomb shelters concentrate on the use of thick concrete walls.

Head for the basement as soon as the siren sounds and remain as close as possible to heavy, supporting columns to avoid the danger of collapsing beams. Stay away from all entrances and all windows. If there are heavy steel doors and shutters, close them.

The British government recommends construction of raid shelters on the order of the Anderson-type, built outside many British homes during the Hitler blitz. These were steel arches, six feet high and four-and-a-half feet wide, half buried in the ground. Civil defense authorities assert that if three feet of earth were piled above the arch, the shelter could protect all inside from the four main causes of death and injury.

Don't be in a rush to emerge from your hideout—stay there until you have been assured the bomb will not be dropped, long enough for radiation outside to wear off.

IF YOU ARE TRAPPED ON THE TOP FLOOR OF A BUILDING . . .

and descent to the basement is prevented by jammed elevators and stairs, don't join the mob battling to get down. Proceed to a point as close to the center of the building as possible and lie against a wall or strong supporting column, out of line of the windows. Or crawl under a table, sofa or desk which would provide protection against flying glass.

IF YOU ARE WALKING ON THE STREET . . .

get out of the open. Remember that flash and flame burns killed 50 per cent of the 106,000 persons who died in the atomic attack on Hiroshima and Nagasaki and accounted for 75 per cent of all casualties. The bomb's heat rays travel in a straight line—so all you have to do is get inside.

Head for the nearest official shelter. If there aren't any, a subway—the deeper the better—will do as well.



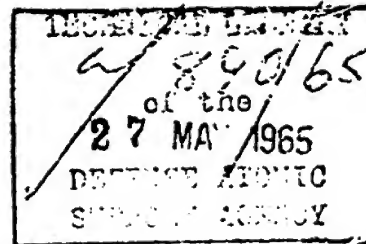
Protection due to "smoke screen"

No. 175 of 185 copies, Series A

OPERATION PLUMB BOB



NEVADA TEST SITE
MAY-OCTOBER 1957



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REQUESTED BY USERS OF DDC.

Project 8.2

PREDICTION of THERMAL PROTECTION of UNIFORMS, and THERMAL EFFECTS on a STANDARD-REFERENCE MATERIAL (U)

Issuance Date: May 2, 1960

HEADQUARTERS FIELD COMMAND
DEFENSE ATOMIC SUPPORT AGENCY
SANDIA BASE, ALBUQUERQUE, NEW MEXICO

JUN 7 1965

ISIA D

This material contains information affecting the national defense of the United States within the meaning of the espionage laws Title 18, U. S. C., Secs. 793 and 794, the transmission or revelation of which in any manner to an unauthorized person is prohibited by law.

1.2.2 Comparison of Skin-Simulant Response and Burns to Pigs. The improved NML skin simulant, molded from silica-powder-filled urea formaldehyde, has the thermocouple embedded at a depth of 0.05 cm in order to give burn predictions based on maximum temperature attainment. The basic criterion is a rise of 25 C or more for a second-degree burn to human skin or for a 2+ mild burn to pig skin. This criterion is based on the assumption of (1) the equivalence of a minimal white burn on the rat skin (or a 2+ mild burn in pig skin) to a second-degree burn in human skin, (2) an initial skin temperature of 31 C, and (3) correspondence of the thermal properties of pig, rat, and human skin. The accuracy of such a burn prediction in terms of incident radiant exposure is estimated to be ± 10 percent. A skin-simulant temperature rise of 20 C or greater is estimated to correspond to a first-degree human burn or a 1+ moderate pig skin burn, and a rise of 35 C is estimated for a third-degree human burn or a 3+ mild pig burn. The latter estimations, probably accurate to ± 20 percent, are based on pig-burn data obtained at the University of Rochester (Reference 6).

12

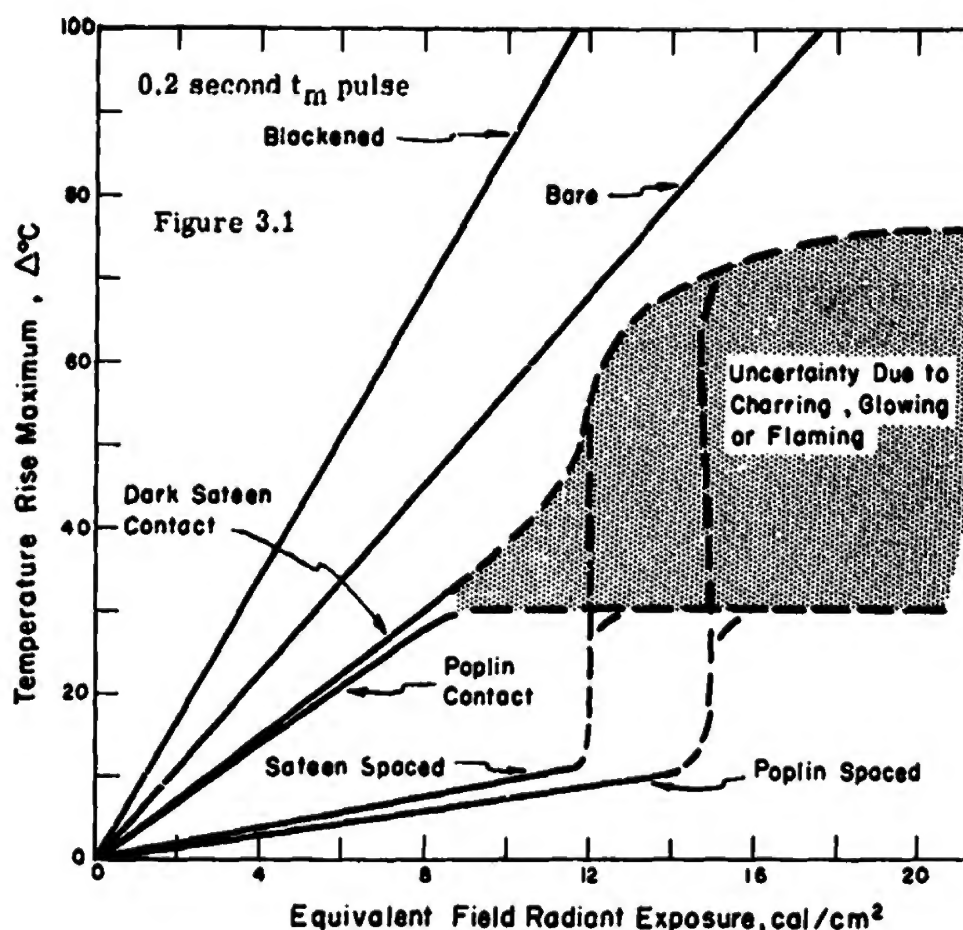
CONFIDENTIAL

TABLE 2.1 RADIANT ABSORPTANCES OF SKIN SIMULANT AND STANDARD FABRICS

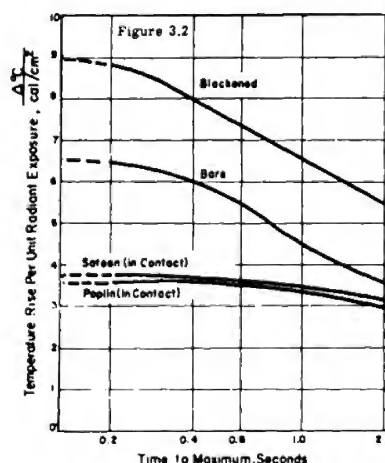
Specimen	Radiant Absorptance
Skin simulant, bare	0.72
Skin simulant, blackened	0.95
Poplin, Shade 116, 5-oz/yd ²	0.63
Sateen, gray, 9-oz/yd ²	0.91

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NOTE: These pigs were strapped to tables and could not beat or roll out outer garment ignition unlike humans



STUDIES ON FLASH BURNS:

THE PROTECTION AFFORDED BY 2, 4 AND 6 LAYER FABRIC COMBINATIONS

George Mixter, Jr., M. D. and Herman E. Pearse, M. D.

THE UNIVERSITY OF ROCHESTER

ABSTRACT

Fabric interposed between a carbon arc source and the skin of Chester White pigs increased the amount of thermal energy required to cause 2+ burns. For the 2, 4 and 6 layers of fabric studied this increase was 3.6, 38 and over 104 cal/cm² respectively when the inner layer of fabric was in contact with the skin. Separation of the inner layer from the skin by 5 mm increased the protective effect of the 2 layer combination from 7.4 to 29 cal/cm², provided the outer layer was treated for fire retardation. If the outer layer was not so treated, sustained flaming occurred which in itself added to the thermal burn.

INTRODUCTION

In the past, work in this laboratory has been directed toward a study of flash burns in unshielded skin. It is well known from the atomic bombing in Japan that this type of burn was modified by clothing. A laboratory analysis of the protective effect of fabrics against flash burns was begun (5) by shielding the skin with a few representative fabrics and their combinations.

1. 2 Layers
 - a. light green oxford
knitted cotton underwear
 - b. light green oxford (HPM)
knitted cotton underwear

2. 4 Layers
olive green sateen
thin cotton oxford
wool-nylon shirting
knitted cotton underwear

3. 6 Layers
olive green sateen
thin cotton oxford
mohair frieze
rayon lining
wool-nylon shirting
knitted wool underwear

5. Morton, J. H., Kingsley, H. D., and Pearse, H. E., "Studies on Flash Burns: The Protective Effects of Certain Fabrics", Surgery, Gynecology and Obstetrics, 94, 497-501 (April 1952).

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WT-770

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This document consists of 64 pages
No. 196 of 295 copies, Series A

AD B951673

OPERATION UPSHOT-KNOTHOLE

Project 8.5

THERMAL RADIATION PROTECTION AFFORDED TEST ANIMALS BY FABRIC ASSEMBLIES

REPORT TO THE TEST DIRECTOR

by

J. Fred Oesterling and Staff

UNCLASSIFIED

REGRADED

BY AUTHORITY OF *DA Form 1575 FCB 2* *274/24*
BY *B. W. S. 73 SEP 64* July 1955

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Dissemination Section 144B, Atomic
Energy Act, 1954

~~RESTRICTED DATA~~

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Quartermaster Research and Development Laboratories
Army Medical Service Graduate School
Walter Reed Army Medical Center
University of Rochester Atomic Energy Project

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4.1.2 Factors Contributing to the Greater Degree of Thermal Protection in the Field.

There are several conditions encountered in the field, especially at the higher energy levels, but not duplicated in the laboratory (at least not up to the present time) that may account for the fact that like amounts of thermal energy did not produce comparable results in the laboratory and in the field. First, the thermal energy is delivered much more rapidly with the explosion of an atomic bomb than it is in the laboratory. Second, due to smoke obscuration the animals in the field actually received a smaller percentage of the total energy delivered than they did in the laboratory. Third, the blast wave following the explosion tended to extinguish flames and remove char, whereas no such wave was present in the laboratory tests. Fourth, where the heat reached the fabric layer next to the skin, uniform drape (or spacing) provided additional protection in the field.

(2) Motion pictures of clothed animals, exposed to 50.0 and 33.5 cal/cm² on Shots 9 and 10 respectively, showed heavy clouds

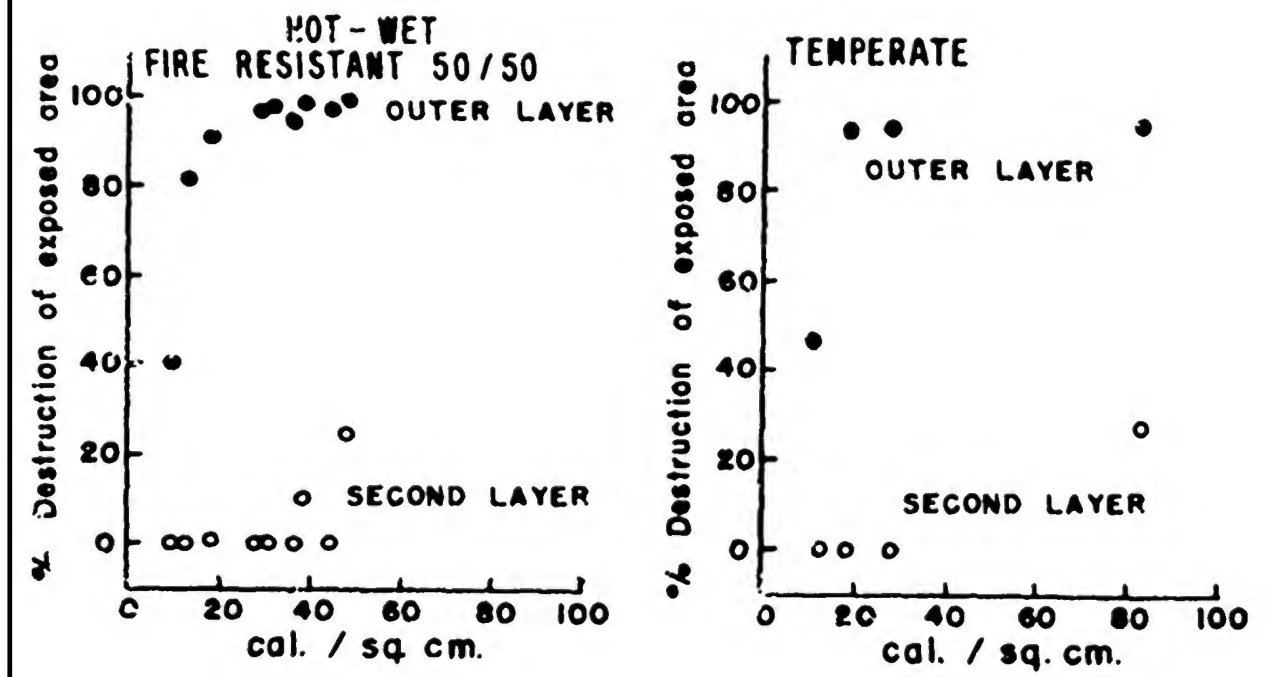
45

of black smoke enveloping the animals within 120 ms of the explosion.

(3) The blast wave following the explosion, which has not been duplicated in laboratory applications of thermal energy, has two possible protective effects. First, it can be expected to extinguish flames induced by the radiation in assemblies not treated for fire resistance, thus removing a source of high heat. Although the blast wave may not actually extinguish the flame in all cases,* it can be expected in general to have this effect. Second, the blast wave would tend to remove any char which, if allowed to remain, would act as a heat reservoir and increase the likelihood of a severe burn.

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Fig. 3.5 Destruction of Outer and Second Layers of Pigs' Uniforms (Shots 9 and 10)



cue for survival

OPERATION CUE

A.E.C. NEVADA TEST SITE

MAY 5, 1955



A report by the FEDERAL CIVIL DEFENSE ADMINISTRATION

EFFECTS OF NUCLEAR WEAPONS

BY HAROLD L. GOODWIN,

Director, Atomic Test Operations, FCDA

The time of travel of the shock wave is not generally understood by many persons. The concept of "duck and cover," which would still be of great value in case of attack without warning, is based on the comparatively large time interval between the burst and arrival of the shock wave at a given point.

92

BIOMEDICAL EFFECTS OF THERMAL RADIATION

BY DR. HERMAN ELWYN PEARSE, *Professor of Surgery at the University of Rochester. Consultant to several Government departments, notably the Atomic Energy Commission's Division of Biology and Medicine. Consultant to the Armed Forces Special Weapons Project*

After the Bikini test, I was asked to go to Japan as a consultant for the National Research Council to survey the casualties in Nagasaki and Hiroshima.

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Then we observed the healing of the wounds, and we found again that the wounds healed in the same manner as those that we had produced in the laboratory. There was some difference in these lesions from the ordinary burns of civil life, but I would predict, from what I learned from experiments, that the difference is on the good side. The burns look worse; they are often charred, but they may not penetrate as deeply, and the char acts as a dressing, nature's own dressing.

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For example, if you have 2 layers, an undershirt and a shirt, you will get much less protection than if you have 4 layers; and if you get up to 6 layers, you have such great protection from thermal effects that you will be killed by some other thing. Under 6 layers we only got about 50 percent first degree burns at 107 calories.

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If we can just increase the protection a little bit, we may prevent thousands and thousands of burns.

... For example, to produce a 50-percent level of second-degree burns on bare skin required 4 calories. When we put 2 layers of cloth in contact, it only took 6 calories. But separate that cloth by 5 millimeters, about a fifth of an inch, and it increases the protective effect 5 times. The energy required to produce the same 50-percent probability of a second-degree burn is raised up to 30 calories. So if you wear loose clothing, you are better off than if you wear tight clothing.

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Carl Jelenko, III, M.D.

Department of Surgery

University of Maryland School of Medicine and Hospital

Baltimore, Maryland

Water is Lost through Burned Skin

If, during the first 48 hours after injury, no more fluid is given to an extensively burned patient than he would need in health, the uncompensated loss of fluid from his circulation may cause shock, and if sufficiently severe, death.

Heat is Lost Necessitating a High Food Intake

To make matters worse, evaporation of moisture from the wound surface saps not only the body's water stores but its energy stores as well. When water evaporates from the burned surface, cooling results and the body loses heat. The larger the burn wound, the more water loss and the more heat or energy loss.

How Can the Fluid and Heat Losses Be Diminished?

Think Plastic Wrap as Wound Dressing for Thermal Burns

ACEP (American College of Emergency Physicians) News

<http://www.acep.org/content.aspx?id=40462>

August 2008

By Patrice Wendling

Elsevier Global Medical News

CHICAGO - Ordinary household plastic wrap makes an excellent, biologically safe wound dressing for patients with thermal burns en route to the emergency department or burn unit.

The Burn Treatment Center at the University of Iowa Hospitals and Clinics, Iowa City, has advocated prehospital and first-aid use of ordinary plastic wrap or cling film on burn wounds for almost two decades with very positive results, Edwin Clopton, a paramedic and ED technician, explained during a poster session at the annual meeting of the American Burn Association.

Dr. G. Patrick Kealey, newly appointed ABA president and director of emergency general surgery at the University of Iowa Hospital and Clinics, said in an interview that plastic wrap reduces pain, wound contamination, and fluid losses. Furthermore, it's inexpensive, widely available, nontoxic, and transparent, which allows for wound monitoring without dressing removal.

THE UNITED STATES
STRATEGIC BOMBING SURVEY

THE EFFECTS
OF
THE ATOMIC BOMB
ON
HIROSHIMA, JAPAN

Volume I

Physical Damage Division

May 1947

a. Evidence relative to ignition of combustible structures and materials by heat directly radiated by the atomic bomb and by other ignition sources developed the following: (1) The primary fire hazard was present in combustible materials and in fire-resistive buildings with unshielded wall openings; (2) six persons who had been in reinforced-concrete buildings within 3,200 feet of air zero stated that black cotton black-out curtains were ignited by radiant heat; (3) a few persons stated that thin rice paper, cedar bark roofs, thatched roofs, and tops of wooden poles were afire immediately after the explosion; (4) dark clothing was scorched, and, in some cases, reported to have burst into flame from flash heat; (5) but a large proportion of over 1,000 persons questioned was in agreement that a great majority of the original fires was started by debris falling on kitchen charcoal fires, by industrial process fires, or by electric short circuits.

b. Hundreds of fires were reported to have started in the center of the city within ten minutes after the explosion. Of the total number of buildings investigated 107 caught fire, and, in 69 instances, the probable cause of initial ignition of the buildings or their contents was established as follows: (1) 8 by direct radiated heat from the bomb (primary fire), (2) 8 by secondary sources and (3) 53 by fire spread from exposing buildings.

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3. Conditions on Morning of Attack

a. The morning of 6 August 1945 was clear with a small amount of clouds at high altitude. Wind was from the south with a velocity of about 4½ miles per hour. Visibility was 10 to 15 miles.

(1) Only a few persons remained in the air-raid shelters after the "all-clear" sounded.

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G. CAUSE AND EXTENT OF FIRE

1. Conditions Prior to Attack

The city of Hiroshima was an excellent target for the atomic bomb from a fire standpoint: There had been no rain for three weeks; the city was highly combustible, consisting principally of Japanese domestic-type structures; it was constructed over flat terrain; and 13 square miles (including streets) of the 26.5-square-mile city was more than 5 percent built up (i. e., covered by plan areas of buildings). The remainder of the city comprised water areas, parks and areas built up below 5 percent. Sixty-eight percent of the 13-square-mile area was 27 to 42 percent built up and the 4-square-mile city center was particularly dense, 93.6 percent of it being 27 to 42 percent built up.



THE UNITED STATES
STRATEGIC BOMBING SURVEY

THE EFFECTS
OF
THE ATOMIC BOMB
ON
HIROSHIMA, JAPAN

Volume II

Physical Damage Division

Dates of Survey:

14 October–26 November 1945

Date of Publication

May 1947



PHOTO 36 IX. Shows partly burned coat of boy who was in open near City Hall (Building 28) 3,800 feet from AZ.

4. The city, consisting principally of Japanese domestic structures, was highly combustible and densely built up. Sixty-eight percent of the 13-square-mile city area was 27 to 42 percent built up and the 4-square-mile city center was particularly dense, 94 percent of it being 27 to 42 percent built up. All the large industrial plants were located on the south and southeast edges of the city.

8. Evidence relative to ignition of combustible structures and materials by directly radiated heat from the atomic bomb and other ignition sources was obtained by interrogation and visual inspection of the entire city. Six persons who had been in reinforced-concrete buildings within 3,200 feet of air zero stated that black cotton black-out curtains were ignited by flash heat. A few persons stated that thin rice paper, cedar bark roofs, thatched roofs, and tops of wooden poles were afire immediately after the explosion. Dark clothing was scorched and, in some cases, was reported to have burst into flame from flash heat. A large proportion of over 1,000 persons questioned was, however, in agreement that a great majority of the original fires were started by debris falling on kitchen charcoal fires. Other sources of secondary fire were industrial-process fires and electric short circuits.

9. There had been practically no rain in the city for about 3 weeks. The velocity of the wind on the morning of the atomic-bomb attack was not more than 5 miles per hour.

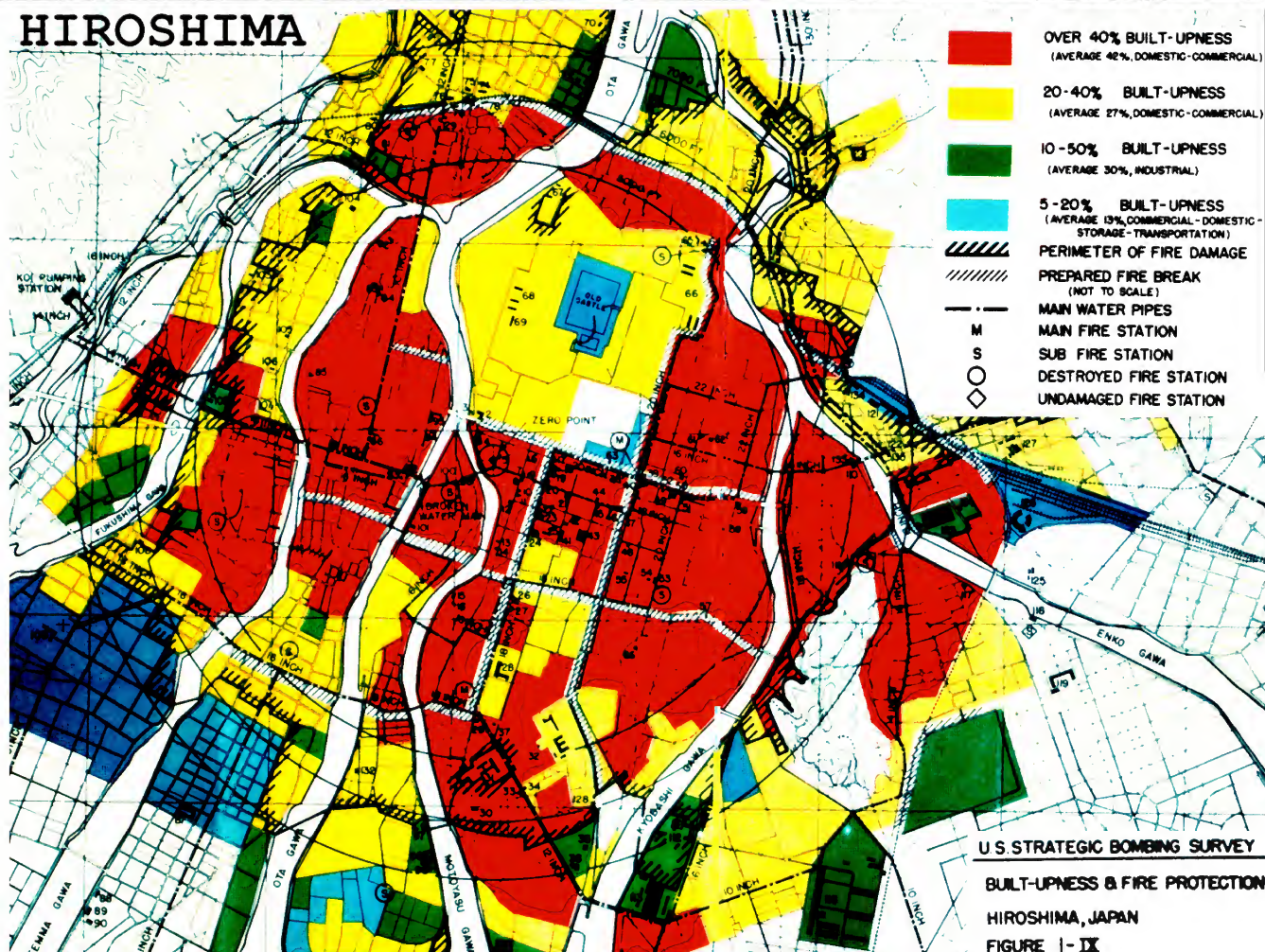
10. Hundreds of fires were reported to have started in the center of the city within 10 minutes after the explosion.

4

(8) Scores of persons throughout all sections of the city were questioned concerning the ignition of clothing by the flash from the bomb. Replies were consistent that white silk seldom was affected, although black, and some other colored silk, charred and disintegrated. Numerous instances were reported in which designs in black or other dark colors on a white silk kimono were charred so that they fell out, but the white part was not affected. These statements were confirmed by United States medical officers who had been able to examine a number of kimonos available in a hospital. Ten school boys were located during the study who had been in school yards about 6,200 feet east and 7,000 feet west, respectively, from AZ. These boys had flash burns on the portions of their faces which had been directly exposed to rays of the bomb. The boys' stories were consistent to the effect that their clothing, apparently of cotton materials, "smoked," but did not burst into flame. Photo 36 shows a boy's coat that started to smolder from heat rays at 3,800 feet from AZ.



HIROSHIMA



SOURCE: USSBS's report, "The Effects of the Atomic Bomb on Hiroshima, Japan," vol. 2

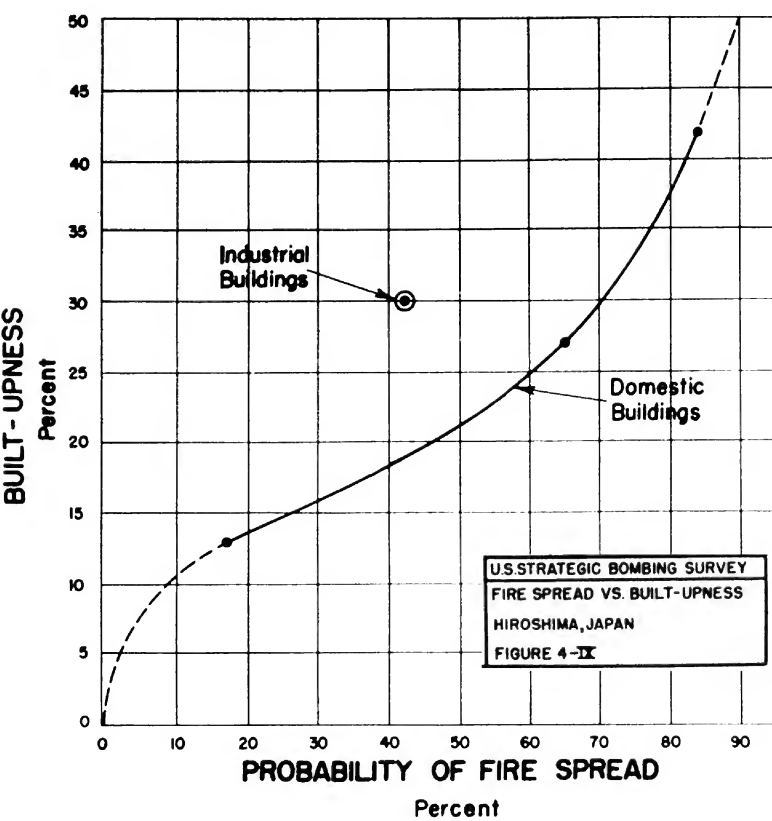
Only 8 of 64 non-wood buildings had thermal flash ignition evidence, 3 had blast damage induced fire, and 28 were ignited by firespread from wood homes.

D. THE CONFLAGRATION

1. Start of Fire

b. *Direct Ignition by the Atomic Bomb.* (1) Six persons were found who had been in reinforced-concrete buildings within 3,200 feet of AZ at the time of the explosion and who stated that black cotton black-out curtains were blazing a few seconds later. In two cases it was stated that thin rice paper on desks close to open windows facing AZ also burst into flame immediately, although heavier paper did not ignite. No incidents were recounted to the effect that furniture or similar objects within buildings were ignited directly by radiated heat from the bomb.

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(4) It was reported that a cotton black-out curtain at an unprotected window in the east stair tower of Building 85 (3,800 feet from AZ) smoked and was scorched by radiated heat from the bomb but it did not burst into flames.

(5) A man who was in the third story of building 26 (3,000 feet from AZ) stated that radiated heat from the bomb ignited cotton black-out curtains at unprotected windows in the west wall and thin rice paper on desks.

(10) Fire fighting with water buckets was reported inside only four buildings (24, 33, 59, and 122) and probably prevented extensive fire damage in them. In Building 24, fire was started in contents of a room at the southwest corner of the second story by sparks from trees on the south side about 1½ hours after the attack. Men inside the building extinguished the fire and probably prevented further damage in the first and second stories (Photo 85). A little later, contents in the third story were ignited by sparks from the outside and were totally damaged. This fire was beyond control before it was discovered, but did not spread downward through open stairs. At Building 33, sparks from the west exposure, which burned in early evening, set fire to black-out curtains in the west wall and to waste paper in the fourth story of the northwest section of the building. Twenty persons were on guard in the building awaiting such an occurrence and the fires were quickly extinguished while in the incipient stage. At Building 59 sparks from the south exposure ignited a few pieces of furniture in the first and third stories and black-out curtains in the first story about 2 hours after the attack. These fires were extinguished by men inside and negligible damage resulted. A few window frames in the east and west walls and 2 or 3 desks in the first story of Building 122 were ignited by radiated heat and sparks from the west and northeast exposures. These fires were extinguished quickly and damage was negligible.

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A. SUMMARY

4. The mean areas of effectiveness (MAE) of the atomic bomb for structural damage about ground zero (GZ) and the radii of the MAE's for the several classes of buildings present were computed to be as follows:

	MAE's in square miles	Radii of MAE's in feet
Multistory, earthquake-resistant.....	0. 03	500
Multistory, steel- and reinforced- concrete frame (including both earthquake- and non-earthquake- resistant construction).....	. 05	700
1-story, light, steel-frame.....	3. 4	5, 500
Multistory, load-bearing, brick-wall..	3. 6	5, 700
1-story, load-bearing, brick-wall.....	6. 0	7, 300
Wood-frame industrial-commercial (dimension-timber construction)....	8. 5	8, 700
Wood-frame domestic buildings (wood-pole construction).....	9. 5	9, 200
Residential construction.....	6. 0	7, 300

USBS Report 92, v2 Hiroshima buildings

	MAE's in square miles	Radii of MAE's in feet
Multistory, earthquake-resistant-----	0. 03	500
Multistory, steel- and reinforced- concrete frame (including both earthquake- and non-earthquake- resistant construction)-----	. 05	700
1-story, light, steel-frame-----	3. 4	5, 500
Multistory, load-bearing, brick-wall--	3. 6	5, 700
1-story, load-bearing, brick-wall-----	6. 0	7, 300
Wood-frame industrial-commercial (dimension-timber construction)-----	8. 5	8, 700
Wood-frame domestic buildings (wood-pole construction)-----	9. 5	9, 200
Residential construction-----	6. 0	7, 300

Building No.: 26. Coordinates: 5H. Distance from (GZ): 2,300, (AZ): 3,000.
NAME: Chugoku Electric Co.
CONSTRUCTION AND DESIGN
Type: Reinforced-concrete frame.
Number of stories: 5 and basement and penthouse JTG class: E1.
Walls: Reinforced concrete (12-inch).

REMARKS: Fire throughout building except in 60 per cent of basement (no fire in basement of west section and about 25 percent of east section). Man who was in third story stated that he saw cotton blackout curtains in west wall and thin paper on desks catch fire from flash of bomb. Fire was reported to have been in all stories 5 minutes after bomb.

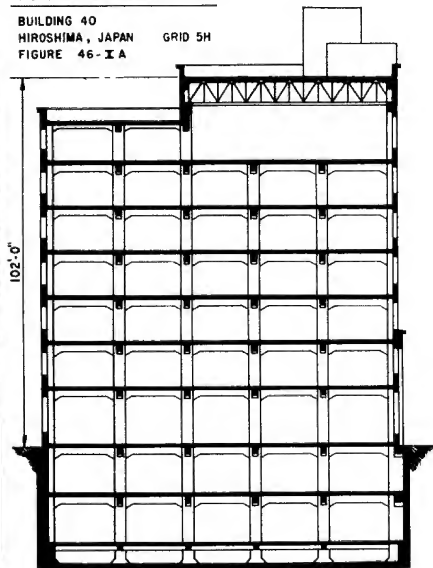


Building No.: 40. Coordinates: 5H. Distance from (GZ): 2,500, (AZ): 3,200.
NAME: Fukuya Department Store.
CONSTRUCTION AND DESIGN:
Type: Reinforced-concrete frame.
Walls: 8-inch reinforced concrete—large windows.

REMARKS: Three persons who were questioned individually stated that this building was afire immediately or within 20 minutes after the bomb. One man who was in the building at the time stated that cotton blackout curtains in the west wall were smouldering immediately after the bomb. The entire building was afire at 1000 hours.



U. S. STRATEGIC BOMBING SURVEY
BUILDING 40
HIROSHIMA, JAPAN GRID 5H
FIGURE 46-1A



Building No.: 24. Coordinates: 5H. Distance from (GZ): 1,300, (AZ): 2,400.
NAME: Bank of Japan, Hiroshima branch.
CONSTRUCTION AND DESIGN
Type: Reinforced-concrete frame (steel core).
Walls: Reinforced concrete (12-inch) and stone (6-inch).
Floors: Reinforced concrete.
Framing: Reinforced concrete.

REMARKS: Fire only in room at southwest corner of second story and in entire third story. No fire in building right after bomb, but afire at 1000 hours. Fire in room in second story extinguished with water buckets.



Building No.: 33. Coordinates: 6H. Distance from (GZ): 5,300, (AZ): 5,600.
NAME: Hiroshima Postal Savings Bureau.
CONSTRUCTION AND DESIGN
Type: Reinforced-concrete frame.
Number of stories: 4 and basement. JTG class: E1.
Roof: Reinforced concrete, tile finish.
Partitions: Reinforced concrete.
Walls: Reinforced concrete, tile finish.

REMARKS: Sparks from west exposure ignited cotton black-out curtains in west wall at 2000 hours and waste paper in fourth story of northwest section at 2100 hours. Fires were extinguished with water buckets by 20 fire guards who were stationed inside. Fire damage to contents was negligible. Paper records stored in wood and steel racks in northeast section of building were exposed to direct radiated heat from bomb but did not catch fire.



Building No.: 86. Coordinates: 5G. Distance from (GZ): 2,000, (AZ): 2,800.
NAME: Kōkō Private Grammar School.
CONSTRUCTION AND DESIGN
Type: Reinforced concrete.
Number of stories: Three. JTG class: E1.
Roof: Reinforced-concrete slab.
Partitions: 9-inch brick and 6-inch reinforced concrete.
Walls: Reinforced concrete (8-10 inches).



Building No.: 59. Coordinates: 5I. Distance from (GZ): 4,100, (AZ): 4,500.
NAME: Geibi Bank Co., Hiroshima Branch (in use at time of bomb as the Higashi Police Station).
CONSTRUCTION AND DESIGN
Type: Reinforced-concrete frame.
Walls: 8-inch reinforced concrete monolithic—medium window.
EXTENT OF FIRE: Total floor area: 16,200 square feet. Floor area burned: 0 square feet; 0 percent (after blast damage).
REMARKS: Sparks from south exposure ignited few pieces of furniture in first and third stories and cotton blackout curtains in first story about 1030 hours. Fires were extinguished with water buckets by people inside. Negligible fire damage resulted. Some of exposing buildings had just been removed prior to the bomb.



Building No.: 49. Coordinates: 5I. Distance from (GZ): 3,000, (AZ): 3,600.
Name: Chūgoku Newspaper.
CONSTRUCTION AND DESIGN
Type: Reinforced-concrete frame.
Number of Stories: 7 and penthouse. JTG class: E1.
Roof: Reinforced-concrete beam and slab.
Partitions: Reinforced concrete—lath and plaster.
Walls: 7-inch reinforced concrete—large windows.
REMARKS: Man who was in building at time of bomb stated fire broke out in third and fourth stories immediately after bomb flash. Head bookkeeper in bank in Building 51 stated that there was fire in third story of Building 49, 10 minutes after bomb flash.



Building No.: 96. Coordinates: G5. Distance from (GZ): 400 (AZ): 2,000.
NAME: Taisho Clothing Store.
Walls: Reinforced concrete (10-inch)



Building No.: 10 Coordinates: 5H. Distance from (GZ): 600, (AZ): 2,100.
 NAME: Nippon Life Insurance Co., Hiroshima branch.
CONSTRUCTION AND DESIGN
 Type: Load-bearing brick wall.
 Number of stories: See drawing. JTG class: F2.
 Roof: Reinforced-concrete slab 6 inch ($\frac{1}{4}$ -inch bars 6-inch oc by 12 inch oc).

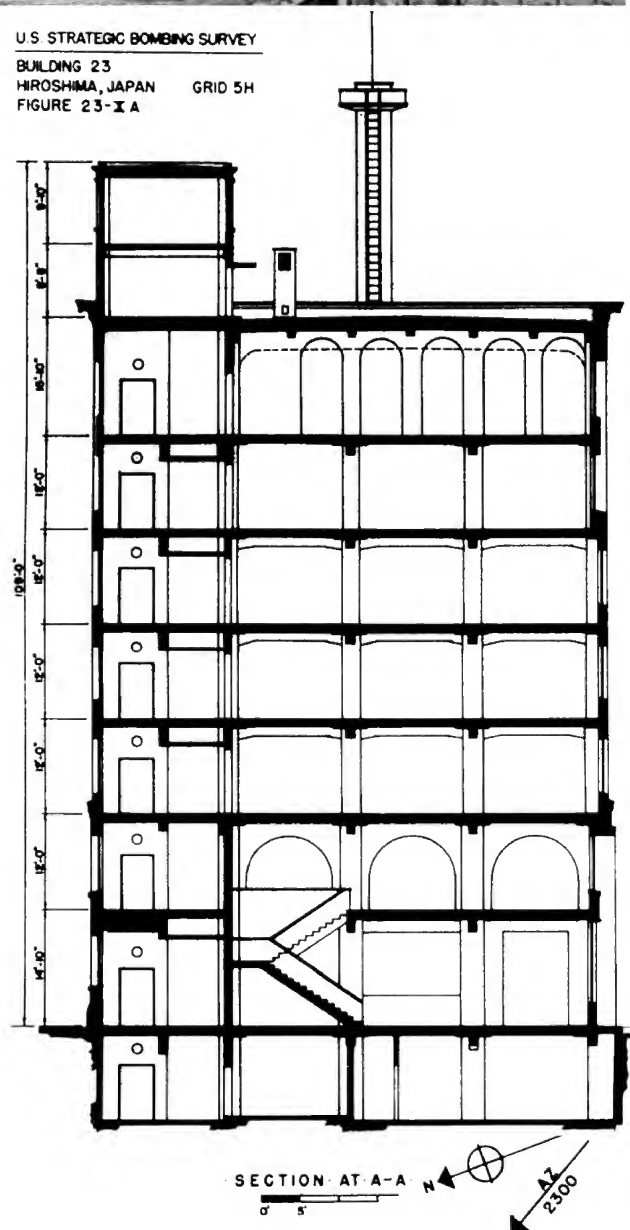
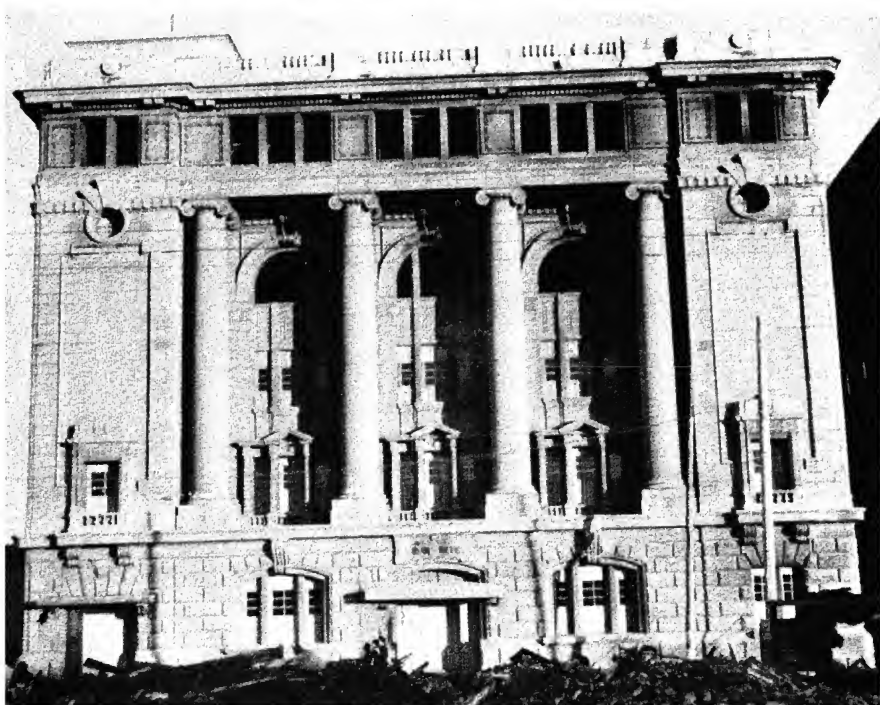


Building No.: 23. Coordinates: 5H. Distance from (GZ): 1,200; (AZ): 2,300.
 NAME: Fukoku Building.
CONSTRUCTION AND DESIGN
 Type: Steel core reinforced-concrete frame.
 Number of stories: 7 and basement. JTG class: E1.
 Roof: Reinforced-concrete beam and slab (steel core).



U.S. STRATEGIC BOMBING SURVEY
 BUILDING 23
 HIROSHIMA, JAPAN GRID 5H
 FIGURE 23-X A

Building No.: 18. Coordinates: 5H. Distance from (GZ): 1,000, (AZ): 2,200.
 NAME: Gelbi Bank Co., Hiroshima Branch.
CONSTRUCTION AND DESIGN
 Type: Reinforced-concrete frame.
 Number of stories: 5 and $\frac{1}{2}$ basement. JTG class: E1.
 Roof: Reinforced-concrete slab (metal pan).
 Partitions: Reinforced-concrete (5-inch). Wood lath and plaster in rear addition.
 Walls: Reinforced concrete (10-inch).



U. S. STRATEGIC BOMBING SURVEY

PHYSICAL DAMAGE DIVISION

Field Team No. 1, Hiroshima, Japan

Building No.: 5. Coordinates: 5H. Distance from (GZ): 100, (AZ): 2,000. Number of stories: 1. JTG class: A 2-3.
NAME: Shima Surgical Hospital. Roof: Tile over wood on wood truss.
CONSTRUCTION AND DESIGN Partitions: Plaster on wood lath and studs.
Type: Bearing wall. Walls: Brick-bearing, 18 inches.



Building No.: 6. Coordinates: 5H. Distance from (GZ): 600, (AZ): 2,100. Number of stories: Three and basement. JTG class: E1.
NAME: Chiyoda Life Insurance Co., Chugoku branch. Roof: Reinforced-concrete beam and slab-tile covered.
CONSTRUCTION AND DESIGN Partitions: Reinforced-concrete, major—metal lath and plaster, minor.
Type: Reinforced-concrete frame. Walls: Reinforced-concrete panels, 10 inches. Reinforced-concrete granite facing.



U. S. STRATEGIC BOMBING SURVEY

PHYSICAL DAMAGE DIVISION

Field Team No. 1, Hiroshima, Japan

BUILDING ANALYSIS

SHEET No. 1

Building No.: 24. Coordinates: 5H. Distance from (GZ): 1,300, (AZ): 2,400.

NAME: Bank of Japan, Hiroshima branch.

CONSTRUCTION AND DESIGN

Type: Reinforced-concrete frame (steel core).

Number of Stories: 3 and basement. JTG class: E1.

Roof: Reinforced-concrete beam and slab.

Partitions: Reinforced concrete and wood lath.

Walls: Reinforced concrete (12-inch) and stone (6-inch).

Floors: Reinforced concrete.

Framing: Reinforced concrete.

Window and door frames: Metal (exterior) wood (interior). Ceilings: Plaster on concrete.

Condition, workmanship, and materials: Excellent.

Compare with usual United States buildings: Much stronger—steel core construction.

OCCUPANCY: Bank.

CONTENTS: Bank and office equipment furnishings.

DAMAGE to building: Only minor damage—top story burned out, partitions, sash, trim blown out in two lower stories.

Cause: Fire.

To Contents: Destroyed in third story—moderate debris and blast damage in first and second stories, none in basement.

Cause: Fire and debris (about equally).

TOTAL FLOOR AREA (square feet): 32,800. Structural damage: —. Superficial damage:

FRACTION OF DAMAGE: Building structural: —. Superficial: —. Contents: 30 percent.

REMARKS: Glass removed from skylight (20 by 20 feet) and light steel-frame structure and roof covered with 12 to 18 inches of sand and cinders.

NOTE.—Building damage based on total floor area. Contents damage is fraction of contents seriously damaged.

SHEET No. 2

(Fire Supplement to Sheet No. 1)

Building No.: 24. Fire classification: R.

WALL OPENINGS: Shutters: Steel rollers.

Shut: Part.

Effect of blast: Blown in.

FLOOR OPENINGS:

	Enclosed	Fire doors	Automatic	Effect of blast
Stairs:	Part	Steel rollers	No	None—doors open.
Elevators:	Yes	Metal and W. G.	No	Bent.

EXPOSURE:

Location	Distance	Firebreak Clearance	Fire Class	Fire Burned	Remarks
N	25'	No	C	Yes	14-foot concrete wall between.
E	25'	No	R	Yes	Building 25 (14-foot wall between).
S	—	No	—	—	No exposure.
W	125'	Yes	C	Yes	

PROBABLE CAUSE OF FIRE: Fire spread from exposures.

VERTICAL FIRE SPREAD: No.

EXTENT OF FIRE: Total floor area: 32,800 square feet. Floor area burned: 5,200 square feet; 16 percent (after blast damage).

REMARKS: Fire only in room at southwest corner of second story and in entire third story. No fire in building right after bomb, but afire at 1000 hours. Fire in room in second story extinguished with water buckets.



U. S. STRATEGIC BOMBING SURVEY

PHYSICAL DAMAGE DIVISION

Field Team No. 1, Hiroshima, Japan

BUILDING ANALYSIS

SHEET No. 1

Building No.: 59. Coordinates: 5I. Distance from (GZ): 4,100, (AZ): 4,500.

NAME: Geibei Bank Co., Hiroshima Branch (in use at time of bomb as the Higashi Police Station).

CONSTRUCTION AND DESIGN

Type: Reinforced-concrete frame.

Number of stories: See sketch. JTG class: E1.

Roof: Reinforced-concrete beam and slab.

Partitions: 7-inch reinforced concrete.

Walls: 8-inch reinforced concrete monolithic—medium window.

Floors: Reinforced-concrete beam and slab—parquet and tile.

Framing: Reinforced-concrete beam and slab.

Window and door frames: Steel. Ceilings: Sheet metal on wood framing.

Condition, workmanship and materials: Good.

Compare with usual United States buildings: Appreciably stronger than United States design.

OCCUPANCY: Police station (office).

CONTENTS: Office equipment.

DAMAGE to building: Minor damage only—sash blown out and hung ceilings partially stripped.

Cause: Blast.

To contents: Slight damage to contents from blast and debris.

Cause: Blast.

TOTAL FLOOR AREA (square feet): 16,200. Structural damage: —. Superficial damage:

FRACTION OF DAMAGE: Building. Structural:

Superficial: Contents: 10 percent.

REMARKS:

NOTE.—Building damage based on total floor area. Contents damage is fraction of contents seriously damaged.

SHEET No. 2

(Fire Supplement to Sheet No. 1)

Building No.: 59. Fire classification: R.

WALL OPENINGS: Shutters: Steel rollers in east wall and third story of south and west walls (wired glass in all windows).

Effect of blast: Blown in at west wall, bent at south wall.

FLOOR OPENINGS:

	Enclosed	Fire doors	Auto matic	Effect of blast
Stairs:	Yes	Metal	No	Bent slightly.
Elevators:				

EXPOSURE:

		Firebreak	Fire	
Location	Distance	Clearance	Class	Burned
N	150'	Yes	C	Yes
E	60'	Yes	C	Yes
S	30'	Partial	C	Yes
		100'		
W	60'	Yes	C	Yes

All exposures burned.

PROBABLE CAUSE OF FIRE: Fire spread from exposures.

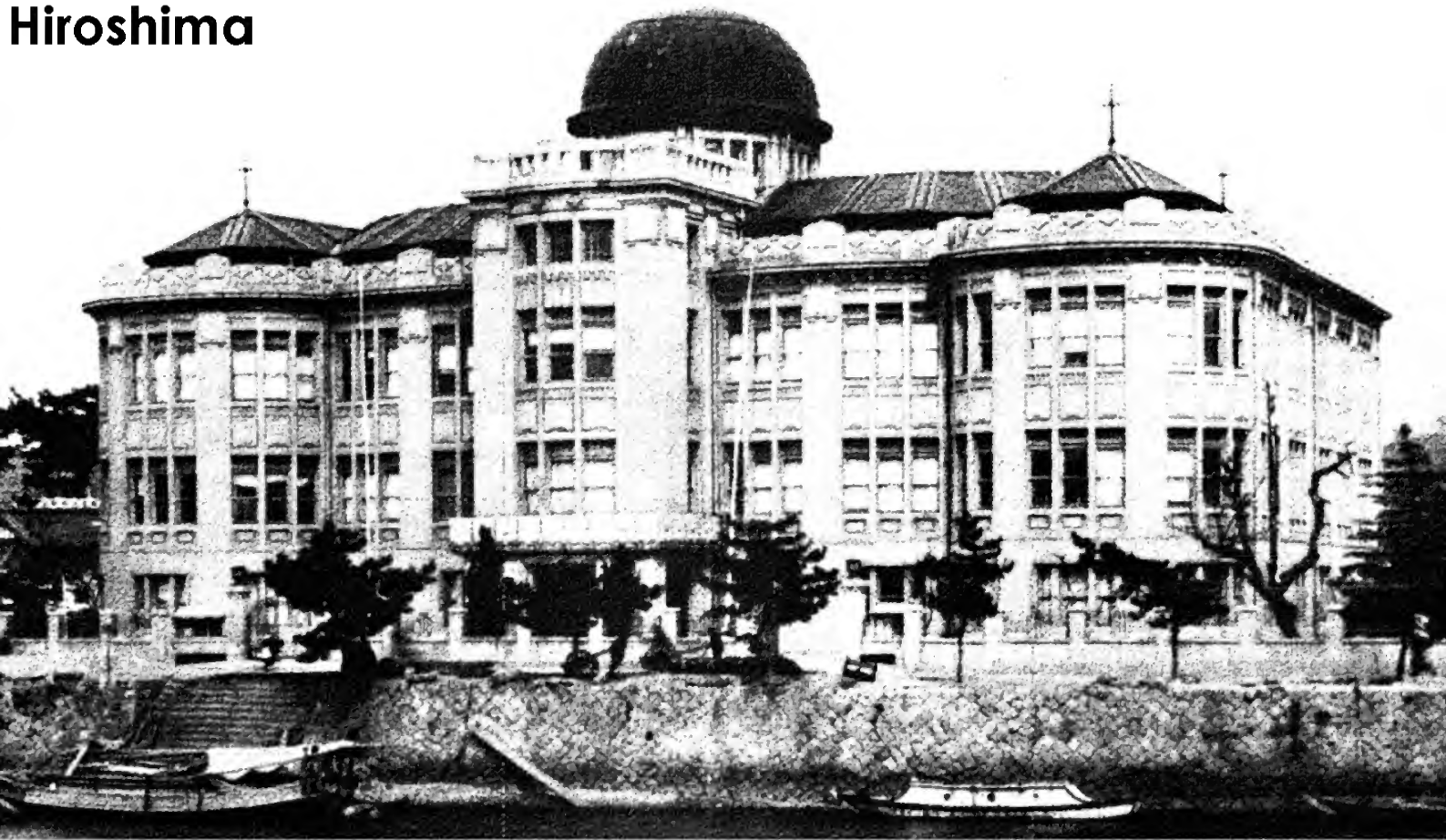
VERTICAL FIRE SPREAD: No.

EXTENT OF FIRE: Total floor area: 16,200 square feet. Floor area burned: 0 square feet; 0 percent (after blast damage).

REMARKS: Sparks from south exposure ignited few pieces of furniture in first and third stories and cotton blackout curtains in first story about 1030 hours. Fires were extinguished with water buckets by people inside. Negligible fire damage resulted. Some of exposing buildings had just been removed prior to the bomb.



Hiroshima



Commercial Museum (300 meters) before and after



BANK OF JAPAN BUILDING AFTER ATTACK ON HIROSHIMA



GEIBI BANK CO. BUILDING AFTER ATTACK ON HIROSHIMA

Bank of Japan: USSBS Building 24, 1300 ft from GZ
 Geibi Bank Co: USSBS Building 59, 4100 ft from GZ
 (Table 5 of USSBS report 92 Hiroshima, v2.)

In both, survivors extinguished fire with water buckets.
 (Ref: Panel 26 of the "DCPA Attack Environment Manual", Chapter 3.)

Building No.: 24. Coordinates: 5H. Distance from (GZ): 1,300, (AZ): 2,400.

NAME: Bank of Japan, Hiroshima branch.

CONSTRUCTION AND DESIGN

Type: Reinforced-concrete frame (steel core).

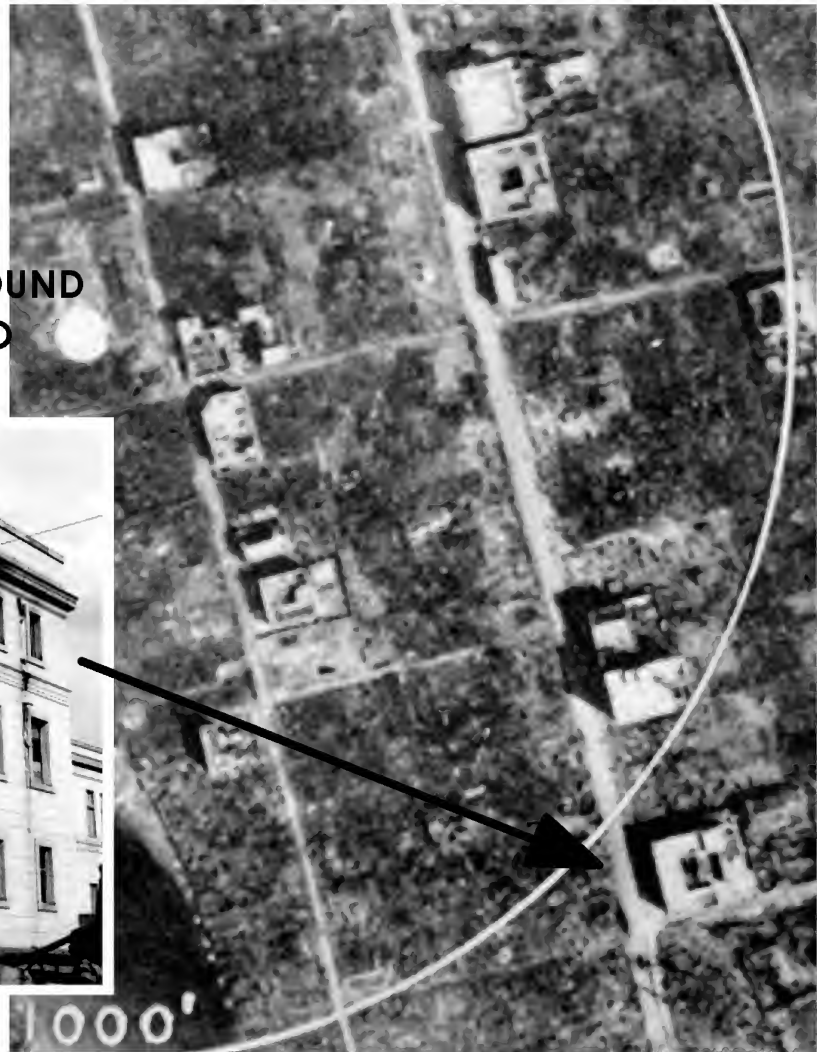
Walls: Reinforced concrete (12-inch) and stone (6-inch).

Floors: Reinforced concrete.

Framing: Reinforced concrete.

REMARKS: Fire only in room at southwest corner of second story and in entire third story. No fire in building right after bomb, but afire at 1000 hours. Fire in room in second story extinguished with water buckets.

**GROUND
ZERO**



U.S. Strategic Bombing Survey report 92

1000'



Secondary Fires

Secondary fires are those that result from airblast damage. Their causes include overturned gas appliances, broken gas lines, and electrical short-circuits. McAuliffe and Moll (Reference 1) studied secondary fires resulting from the atomic attacks on Hiroshima and Nagasaki and compared their results with data from conventional bombings, explosive disasters, earthquakes, and tornadoes. Their major conclusion was that secondary ignitions occur with an overall average frequency of 0.006 for each 1000 square feet of floor space, provided airblast peak overpressure is at least 2 psi. The frequency of secondary ignitions appears to be relatively insensitive to higher overpressures.

Based on surveys of Hiroshima and Nagasaki buildings.

FREQUENCY OF SECONDARY IGNITIONS AS A FUNCTION OF BUILDING TYPE

<u>Type of Structure</u>	<u>Frequency of Secondary Ignitions (for each 1,000 square feet of floor area)</u>
Wood	0.019
Brick	0.017
Steel	0.004
Concrete	0.002

MULTIPLYING FACTOR FOR TYPES OF BUILDING OCCUPANCIES

<u>Type of Occupancy</u>	<u>Multiplying Factor</u>
Public	0.4
Mercantile	0.5
Residential	0.5
Manufacturing	1.0
Miscellaneous	10.0

MULTIPLYING FACTOR FOR TIME OF DAY

<u>Time of Day</u>	<u>Multiplying Factor</u>
Night	0.5
Day (other than mealtimes)	1.0
Mealtimes	2.0

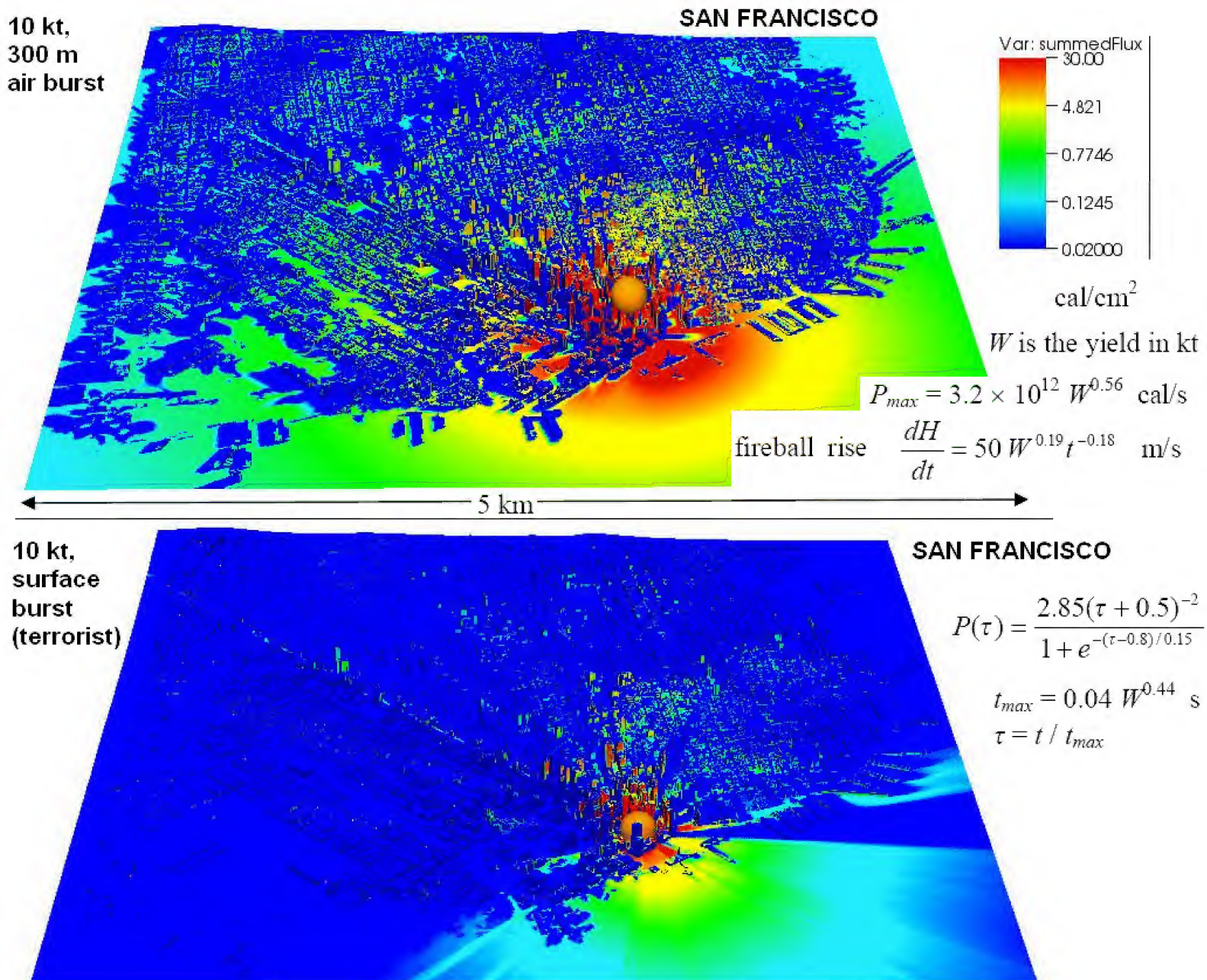
1. Secondary Ignitions in Nuclear Attack, J. McAuliffe and K. Moll, Stanford Research Institute, Menlo Park, California 94025, SRI Project 5106 (AD 625173), July 1965.

Thermal Radiation from Nuclear Detonations in Urban Environments

R. E. Marrs, W. C. Moss, and B. Whitlock
Lawrence Livermore National Laboratory

UCRL-TR-231593

June 7, 2007

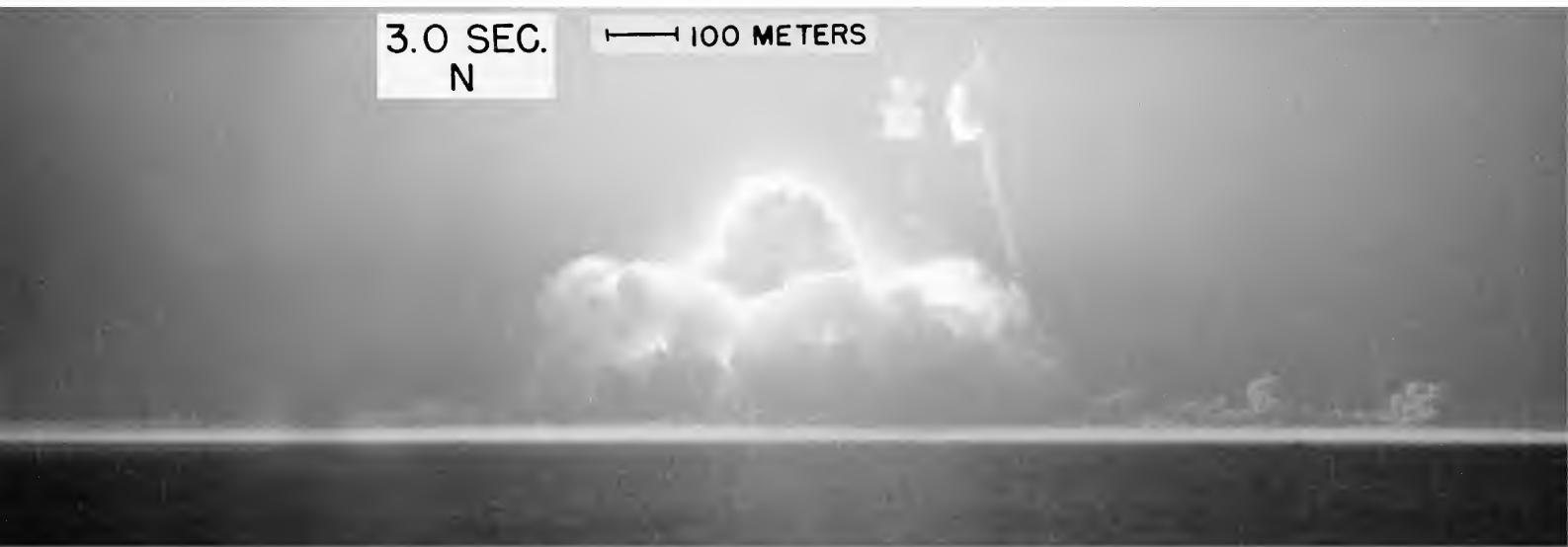


Even without shadowing, the location of most of the urban population within buildings causes a substantial reduction in casualties compared to the unshielded estimates. Other investigators have estimated that the reduction in burn injuries may be greater than 90% due to shadowing and the indoor location of most of the population [6].

We have shown that common estimates of weapon effects that calculate a “radius” for thermal radiation are clearly misleading for surface bursts in urban environments. In many cases only a few unshadowed vertical surfaces, a small fraction of the area within a thermal damage radius, receive the expected heat flux.

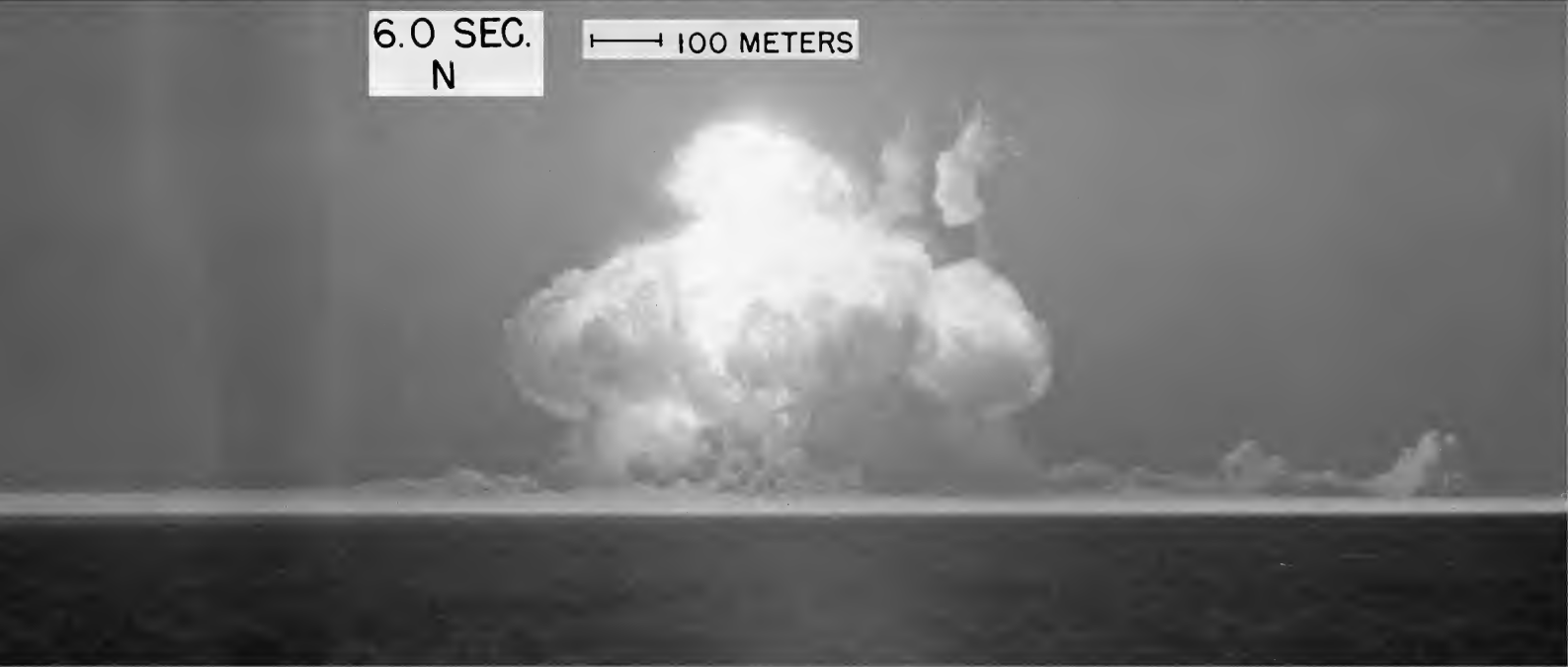
3.0 SEC.
N

100 METERS



6.0 SEC.
N

100 METERS



9.0 SEC.
N

100 METERS



TRINITY (19 kilotons, 100 feet burst altitude, New Mexico, 16 July 1945). Note the very slow rate of fireball rise.

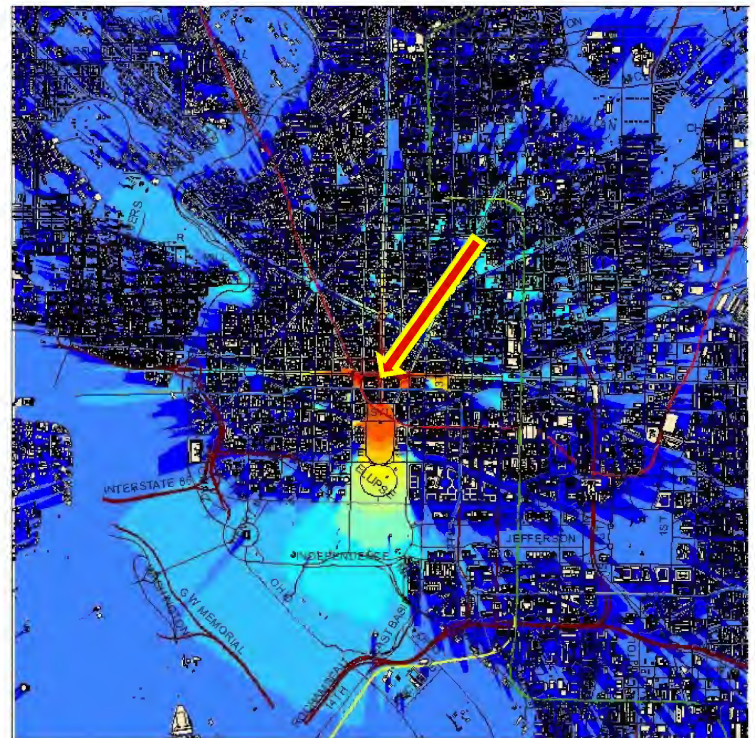
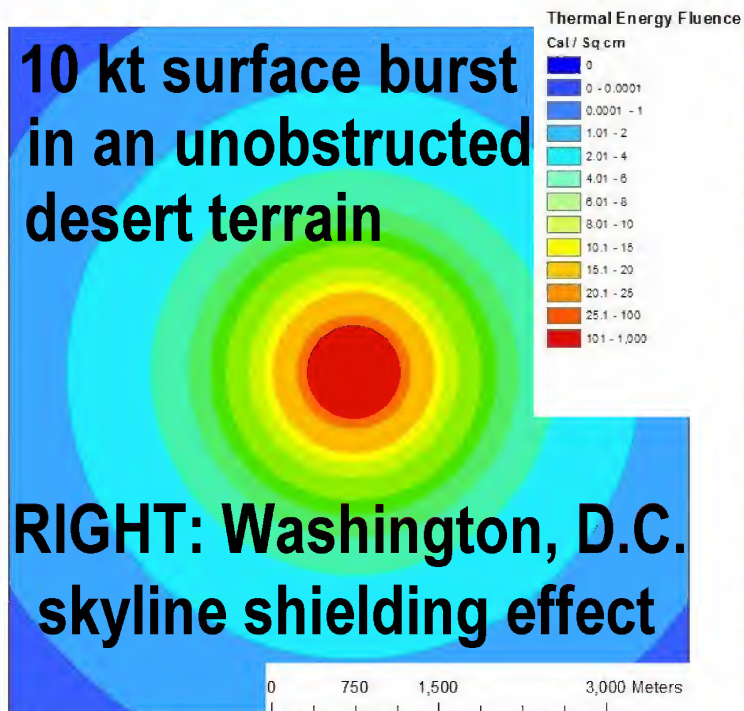
Modeling the Effects of Nuclear Weapons in an Urban Setting

Radiation Countermeasures Symposium
An AFRRRI 50th Anniversary Event

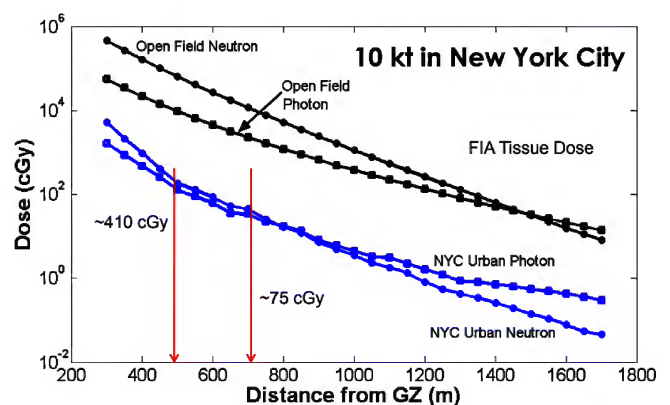
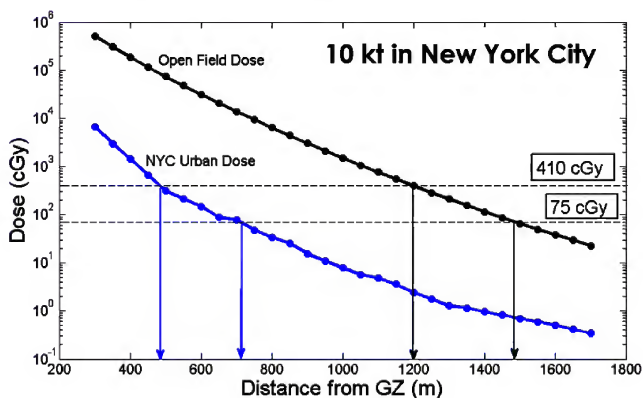
Kyle Millage, CHP, PE
Applied Research Associates, Inc.

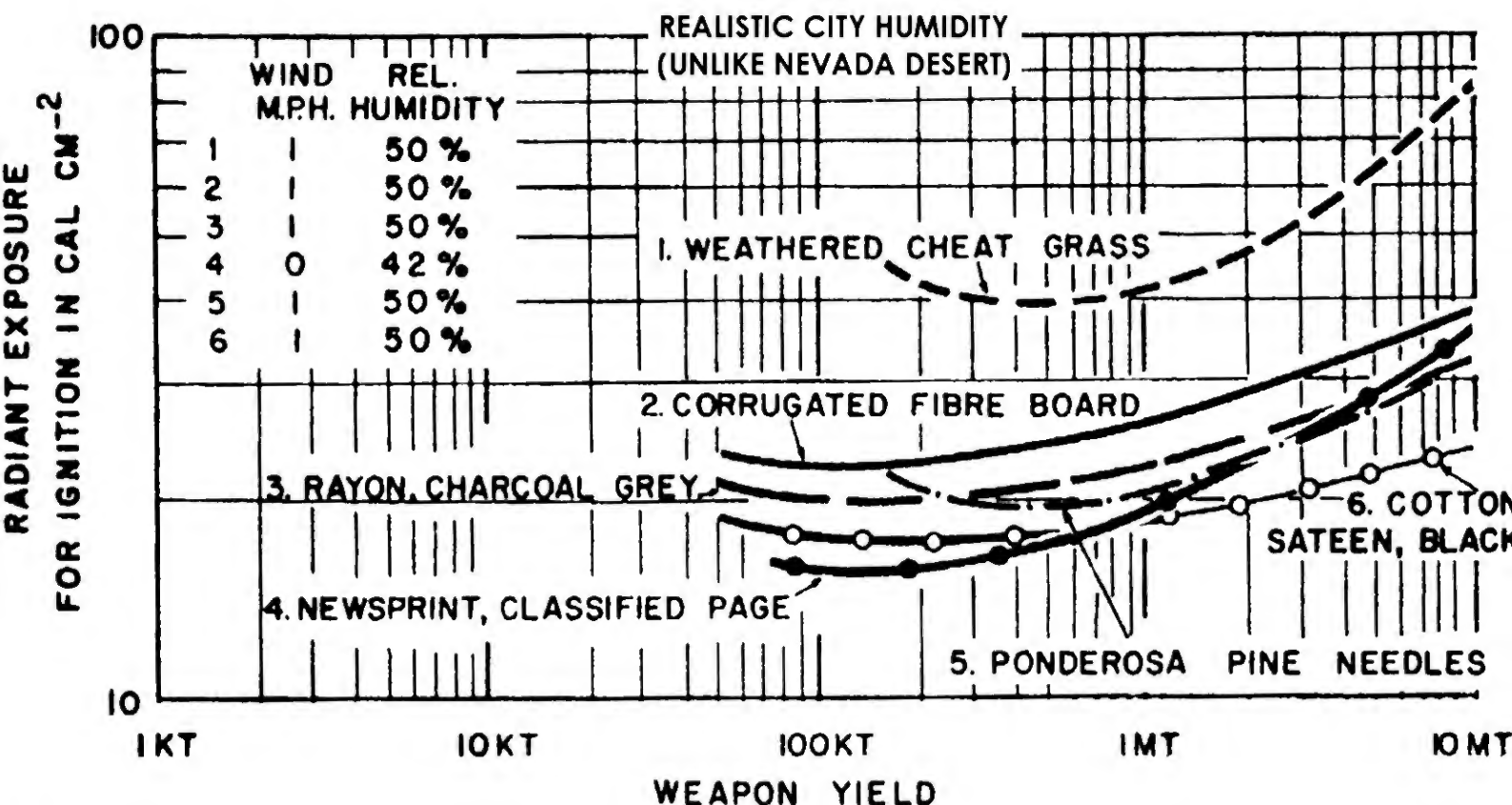
15 June 2011

DoD DISTRIBUTION STATEMENT A APPLIES: Approved for public release; release is unlimited.



- Classic prompt circles of blast, thermal and radiation environments in an open field will significantly over-estimate the effects in an urban setting





"TECHNICAL OBJECTIVE AW-7, CRITICAL RADIANT EXPOSURES FOR PERSISTENT IGNITION", JULY 1960, J. BRACCIAVENTI & F. DEBOLD AD-249476; DASA-1194

UCRL-TR-231593



Thermal radiation from nuclear detonations in

urban environments

June 7, 2007

Even without shadowing, the location of most of the urban population within buildings causes a substantial reduction in casualties compared to the unshielded estimates. Other investigators have estimated that the reduction in burn injuries may be greater than 90% due to shadowing and the indoor location of most of the population [6].

We have shown that common estimates of weapon effects that calculate a "radius" for thermal radiation are clearly misleading for surface bursts in urban environments. In many cases only a few unshadowed vertical surfaces, a small fraction of the area within a thermal damage radius, receive the expected heat flux.

Thermal radiation shadowing in modern high-rise cities

TENEMENTS, COMMERCIAL





FIRE FIGHTING FOR HOUSEHOLDERS



Folded newspapers may not take fire, but loosely crumpled ones will. The answer? Get rid of trash.

A wet mop or broom will snuff out small fires. So will a burlap bag or a small rug soaked in water.

Buckets of water and sand are essential.

Water is an effective fire fighting agent because it smothers and cools at the same time.

RESEARCH TRIANGLE INSTITUTE
Durham, North Carolina

Final Report R-85-1

CRASH CIVIL DEFENSE PROGRAM STUDY

by

K. E. Willis
E. R. Brooks
L. J. Dow

April 30, 1963

Prepared for

OFFICE OF CIVIL DEFENSE
UNITED STATES DEPARTMENT OF DEFENSE

AD0403071

- D-2 -

Feasibility

In the typical household, some materials will generally be available for covering windows against thermal radiation. One half roll of aluminum foil would cover about 25 ft^2 and would provide very effective covering for 1 to 2 windows (those most likely to face the blast). Sufficient quantities of either light colored paint, Bon Ami, or whiting would be available in most households to cover windows. Aluminum screens attenuate from 30 - 50% of the thermal radiation and hence screens should be closed or installed.

The amount of water per square foot required to dissipate 25 cal/cm^2 of thermal radiation can quickly be calculated from the heat of vaporization of water (580 cal/gm). Allowing 90% losses due to absorption or spillage, one gallon of water is sufficient to wet 10 ft^2 of material so that it can withstand 25 cal/cm^2 of direct thermal radiation (i.e., the radiation is normal to the material surface at all points). Since the average daily water consumption per service (Reference 3) is about 700 gallons, it is apparent that the wetting of interior flammables (piled up curtains, furniture, etc.) is feasible in most cases when used in conjunction with the other measures.

3. Statistical Abstracts of the United States. Washington: U. S. Government Printing Office, 1962.

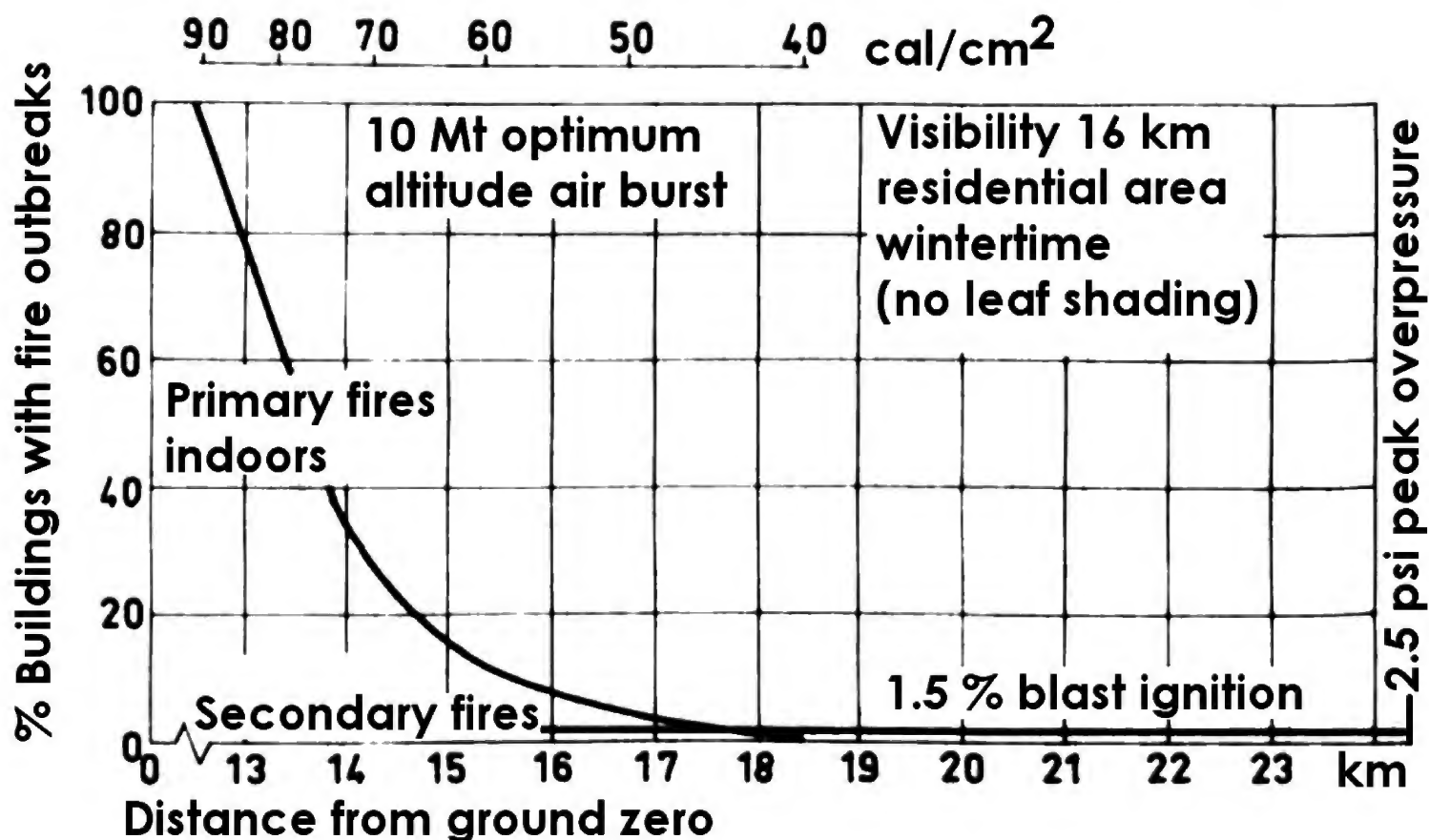
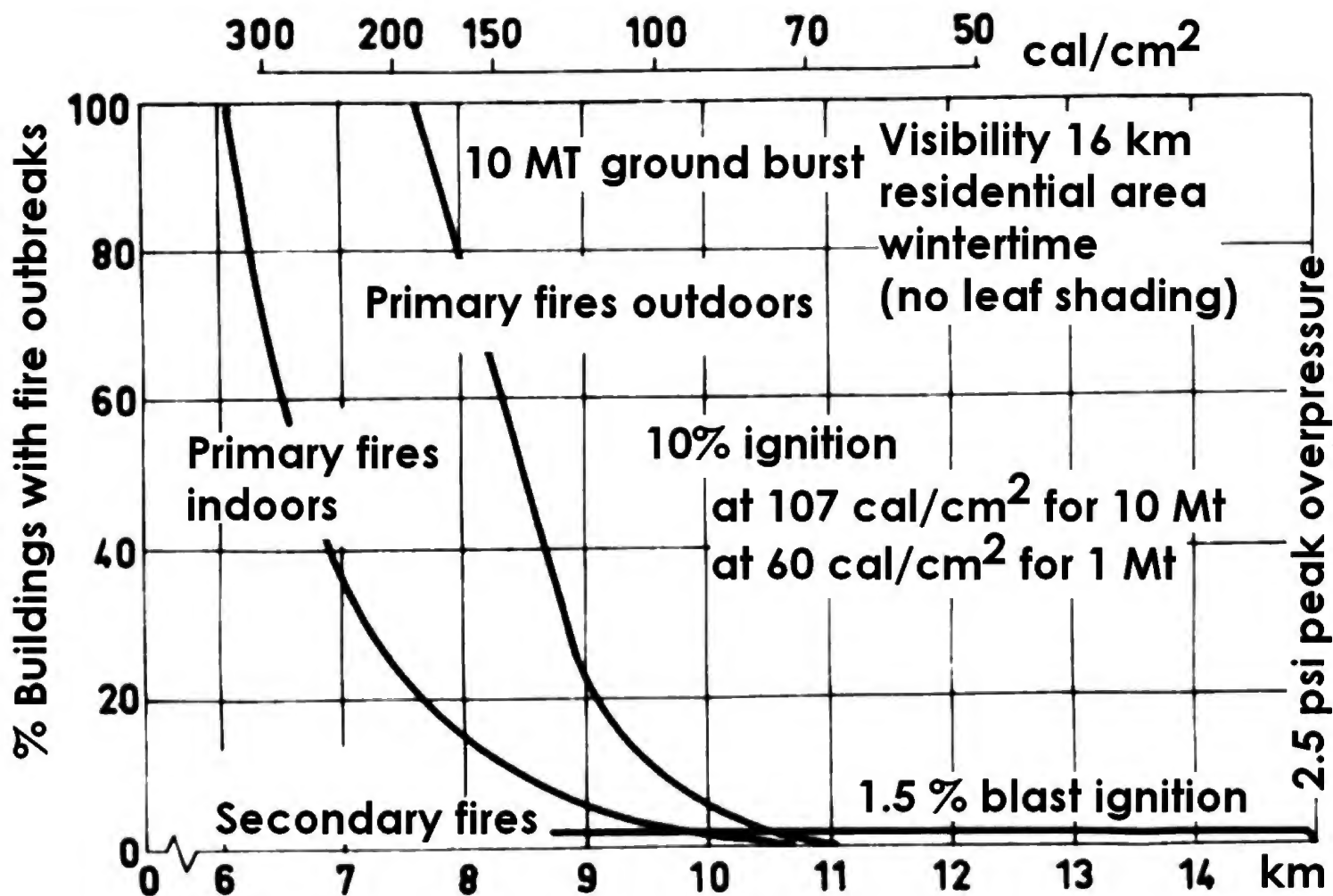
ENCORE nuclear test (Nevada desert) humidity was ONLY 19%

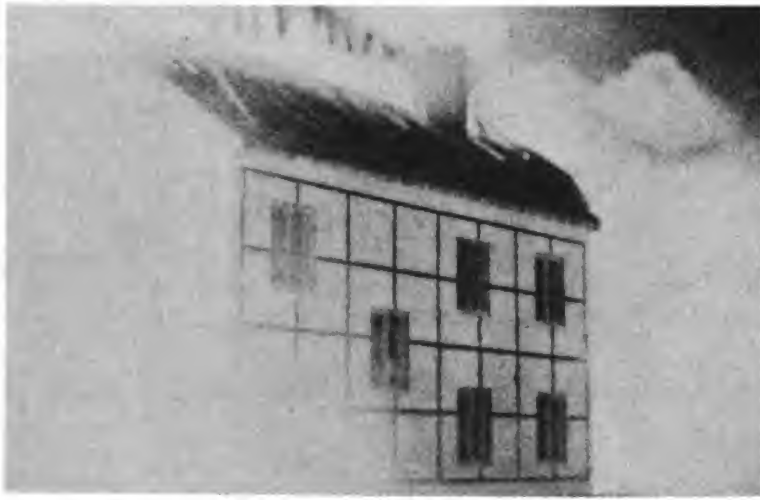
COMPARISON OF ESTIMATES FOR IGNITION ENERGY REQUIREMENTS
(10 mt)

Glasstone (1962) The Effects of Nuclear Weapons		Martin, et al. (1959) Naval Radiological Defense Laboratory	
Material	Cal/cm ² for Ignition	Material	Cal/cm ² for Ignition
			Ratio of NRDL to ENW
Cotton auto seat upholstery, green, brown, white	16	Heavy cotton draperies, dark color	28 1.75
Wool pile chair upholstery, wine	35 (not sustained)	Wool pile chair upholstery, dark color	25 0.7
Newspaper, single sheet	6	Newspaper, medium printed Newspaper, dark areas	40 30 6.7 5.
Kraft paper carton, flat side exposed, used, brown	15	Corrugated Kraft board	40 2.6
Deciduous leaves	12	Walnut leaves Beech leaves	54 36 4.5 3.
Coarse grass	16	Harding grass	44 2.7
Ponderosa pine needles, brown	18	Pine needles	50 2.7

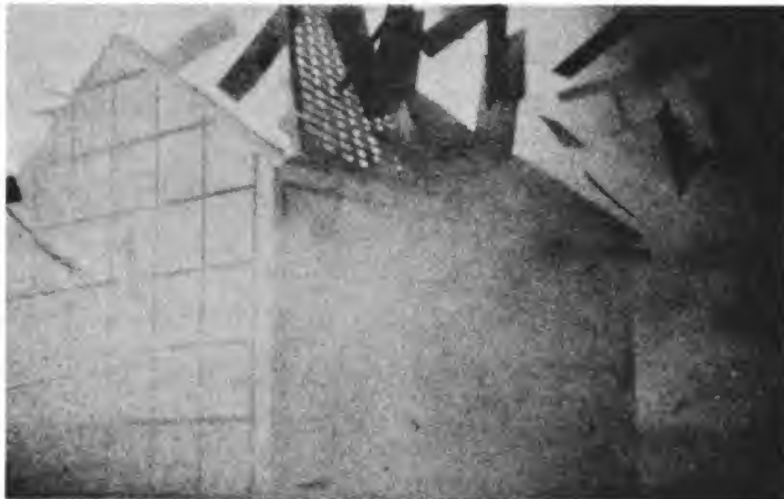
Sources: Martin, et al. (1959) and Glasstone (1962).

Martin, S. B., On Predicting the Ignition Susceptibility of Typical Kindling Fuels to Ignition by the Thermal Radiation from Nuclear Detonations, Tech. Report 367, U.S. Naval Radiological Defense Laboratory, San Francisco, Calif., April 1959. (U)





**47 kt Greenhouse
Easy, Eniwetok
Atoll, 1951. Brick
house, 3 psi peak
overpressure**



0.6 second



Impact + 1.0 second



Afterward

Harold L. Brode

The RAND Corporation, Santa Monica, California

P-2745 August 1963

-17-

We have all had the frustrating experience of trying to light a fire with green, moist, or wet wood. Just as wet wood can't be easily induced to burn, so thick combustibles are not easily ignited. Even a dry two-by-four burns reluctantly and stops burning when taken out of the fire. It is a different matter with a shingle or a bunch of kindling! Density also plays a role, a heavier combustible being harder to ignite than lighter-weight material. Of course, the chemistry of the material to the degree that it influences kindling temperatures and flammability, is an important parameter. Modern plastics tend to smoke and boil - to ablate but not to ignite in sustained burning - while paper trash burns readily.

Just as most materials are not particularly sensitive to the sun's thermal radiation, and are not highly inflammable nor even ignitable, the surfaces exposed to the thermal intensity of a nuclear explosion are generally not given to sustained burning. Very intense heat loads may mar or melt surfaces, may char and burn surfaces while the heat is on, but may snuff out immediately afterward.

-18-

PRIMARY AND SECONDARY FIRES FROM NUCLEAR EXPLOSIONS

Although thermal radiation would start many fires in urban and in most suburban areas, such fires by themselves would seldom constitute a source of major destruction. Outside the region of extensive blast damage, fires in trash piles, in dry palm trunks, in roof shingles, in auto and household upholstery, drapes, or flammable stores are normally accessible and readily controllable. By the very fact that these fires start from material exposed to the incident light, they can be easily spotted and, in the absence of other distractions, can be quickly extinguished. Where the blast effects are severe and damage extensive, little effective fire fighting is likely.

A SURVEY OF THE WEAPONS AND HAZARDS WHICH MAY FACE THE PEOPLE OF THE UNITED STATES IN WARTIME

Harold L. Brode

P-3170

June 1965

-15-

Most exposed surfaces in the city are non-combustible and much of the remainder is not ignitable by thermal flash. Although many fires could simultaneously start wherever building interiors are illuminated by the bomb thermal energy, they are not likely to be immediately beyond control, and will often go out unattended as they exhaust the available fuel (as in trash barrels or isolated wood piles or even pieces of paper on tables or floors).

Hanging non-flammable shields over window openings and removing likely fuels from exposed positions could also help.

RAND CORPORATION

CONFIDENTIAL

WT- 774

Copy No. 126 A

Operation **UPSHOT-KNOTHOLE**

NEVADA PROVING GROUNDS

March - June 1953

Project 8.11a

INCENDIARY EFFECTS ON BUILDING
AND INTERIOR KINDLING FUELS

(ENCORE EFFECT REPORT)

27 kt at 2,423 feet altitude, 19% humidity
(DASA-1251) (Note: cities humidity is ~50-80%)



RESTRICTED DATA

This document contains restricted data as defined in the Atomic Energy Act of 1946. Its transmittal or the disclosure of its contents in any manner to an unauthorized person is prohibited.

HEADQUARTERS FIELD COMMAND, ARMED FORCES SPECIAL WEAPONS PROJECT
SANDIA BASE, ALBUQUERQUE, NEW MEXICO

CONFIDENTIAL

Weapon test report WT-774, Project 8.11a, Incendiary effects on buildings and interior kindling fuels



ENCORE test, Nevada, 1953
10' x 12' wooden houses with 4' x 6' windows
17 calories/sq. cm thermal flash



Immediate room flashover during thermal pulse ("Encore effect") in inflammables-filled house while fire-resistant fabrics in other house survived!



LEFT HOUSE: fire-resistant furnishings
(woolen rugs and clothes, vinyl plastic draperies)



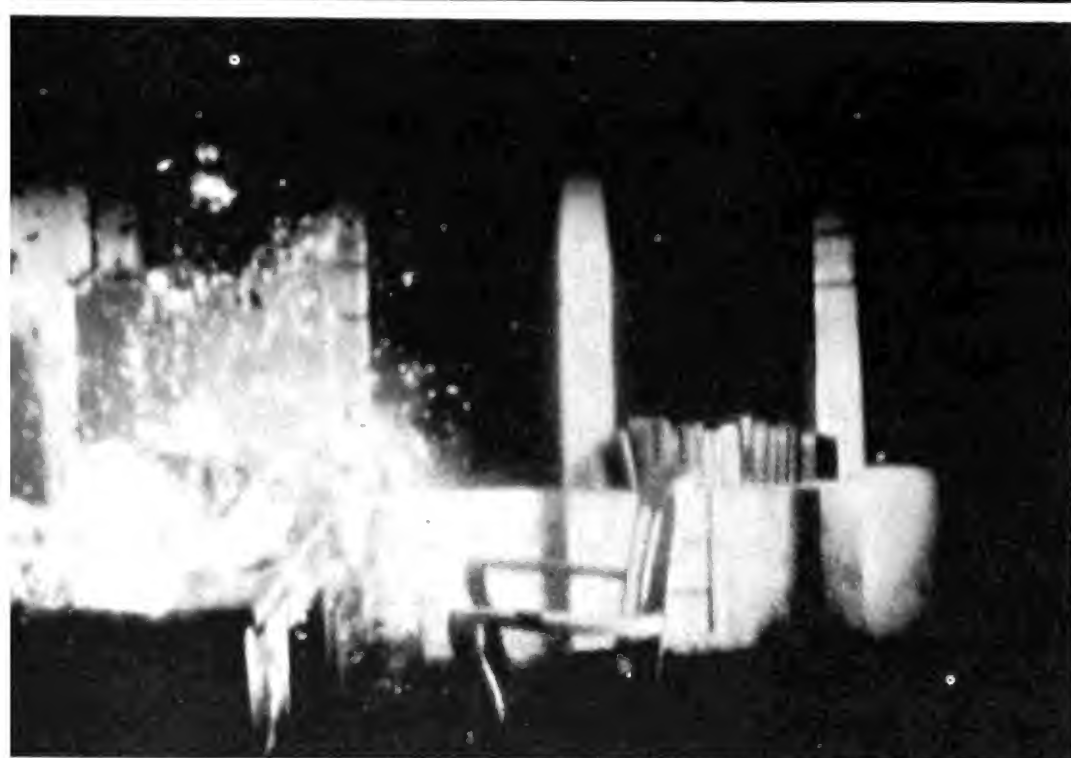
RIGHT HOUSE: non-fire resistant furnishings
plus inflammable magazines and newspapers



Smouldering armchair extinguished 1 hour after detonation, when recovery party arrived at house

**EFFECTS OF 1 PSI
OVERPRESSURE ON
IGNITIONS**

From: Goodale, Effects of
Air Blast on Urban Fires
URS 7009-14 Dec. 1970
(AD 723 429)



**Blast winds both
cool burning
material and
upset flame
convection system.**

**50% of burning
curtains are
extinguished by
1 psi overpressure**

**100% are put out by
2.5 psi. Note that
burning LIQUIDS
in high-wall trays
are not put out by
blast waves, but this
is not relevant to
city fires.**

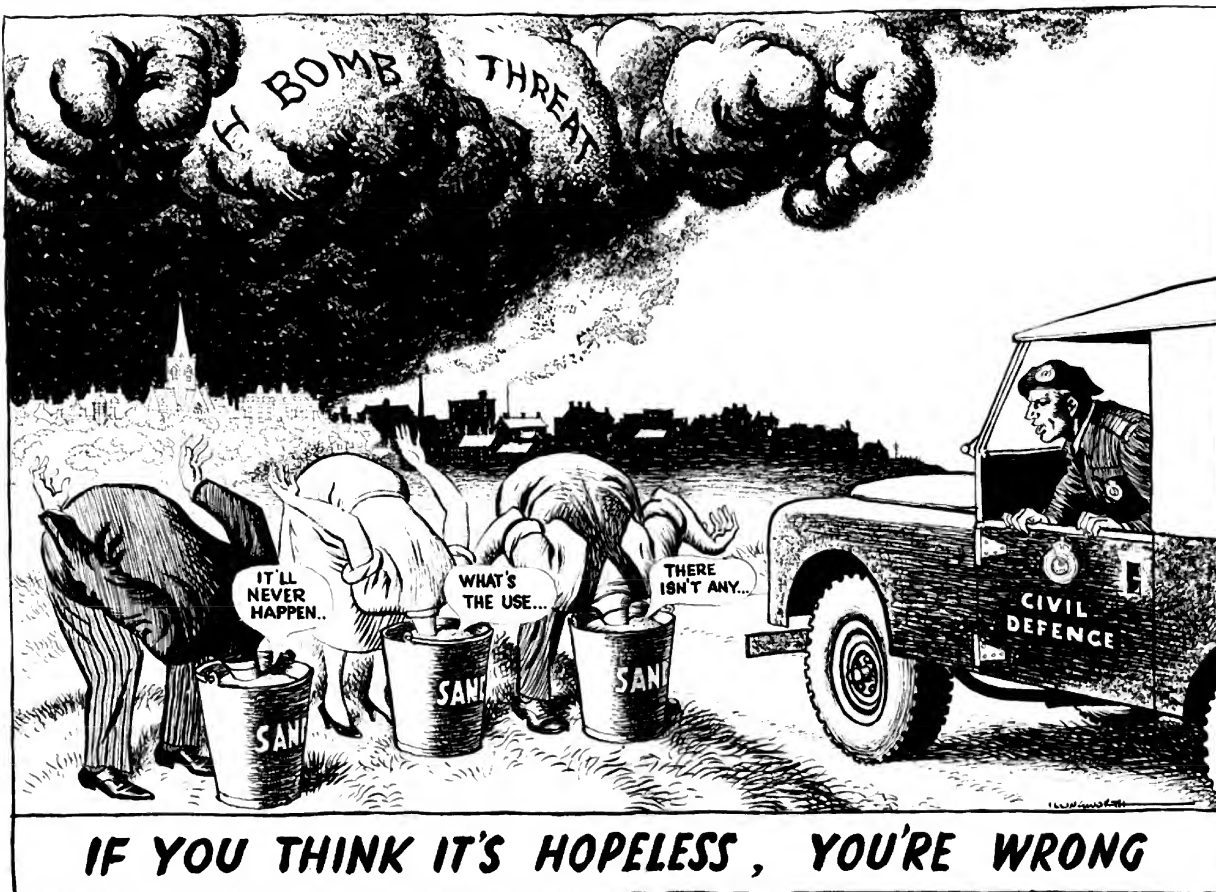
**Burning beds can
continue to smoulder
until extinguished
with water.**

HUMIDITY HAS LESS INFLUENCE ON FINE
KINDLING IGNITION ENERGY
THAN ON WOOD IGNITION



THERMAL PULSE
DRIES LEAVES/PAPER
THERMAL PULSE CANNOT
PENETRATE 1 MM OF WOOD

THERMAL PULSE IS TOO BRIEF
TO DRY OUT WOOD



Cartoon by Leslie Illingworth

Specialty drawn for H.M. Government by Illingworth

FOUR STRAIGHTFORWARD SIMPLE FACTS ABOUT Civil Defence Today

The basic minimum of information for every responsible man and woman

1 The H-Bomb: we hear too much of the horrors, not enough about our chances of survival. Some people will tell you that if this country were attacked with H-Bombs, every man jack of the population would be wiped out. *That just isn't true: it isn't anything LIKE the truth.*

There would be terrible devastation, but for millions and millions of people, chances of survival would be very good. It depends very much on our Civil Defence. The more people we have in it, the better.

2 Civil Defence is well on with the job already. Some people think of Civil Defence equipment as a long-handled shovel, a rather odd tin hat, and so on.

Well, it's not like that at all. Civil Defence today is a modern, country-wide Service, which offers you training with first-class equipment—radio and radiation-testing instruments, fire-fighting apparatus and rescue gear, and the latest four-wheel-drive vehicles. There are thousands of qualified Instructors, three full-time Instructors' Schools, and a Staff College for advanced courses and studies.

The more you get to know about Civil Defence, the more impressed you become.

There is a Civil Defence organisation in every town in the Kingdom, and there are units in thousands of industrial firms. There are *half a million* people in the Civil Defence Services today. But half a million is not enough: not nearly.

3 Civil Defence is useful to you now, in peace. In Civil Defence today, you *learn*. That is the whole aim and object of joining.

You learn, first and foremost, how to live with your eyes open in the same world as the H-Bomb. You begin to learn what this new, nuclear-age world is really like. You acquire a fuller, deeper

understanding of many important events that we are all involved in, whether we like it or not.

Besides this, there is a practical, everyday value in the things you learn. Take just one part of it—First Aid. In Great Britain in 1956 there were over a *quarter of a million* casualties from motor accidents, and probably at least another *million* casualties from accidents in the home. What you know—or don't know—about First Aid could make all the difference to somebody.

Do you know how to put out a fire? Do you know how to operate a radio transmitter? These are two more of the useful, interesting things that Civil Defence could teach you, now.

Do you remember the East Coast floods, the Lynmouth disaster, the Harrow rail smash? These are three of the emergencies where trained volunteers from Civil Defence were ready and able to help. They were needed.

4 Civil Defence wants more volunteers, NOW. It's no good saying "I'll be there on the day." That's too late. There wouldn't be time to train you and organise you.

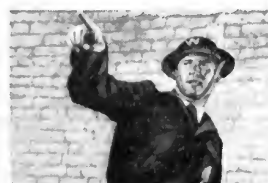
It's no good leaving Civil Defence to other people. For everybody else, *The Other Fellow is YOU.*

You live in this world, you are part of the nuclear-age—there is no opting-out for anybody. Civil Defence *matters*—and *matters* to you.

Go along to your Council Offices today, and ask about Civil Defence. There's no commitment, no 'bull', no length-of-service engagements.

Your training takes only about *one hour a week*. The classes are free, and are near your own home. The knowledge you gain could be useful to you at any time, and would be *VITAL* to you if we were at War.

Civil Defence is sound common sense. It's high time you were in it.



Warden Section



Headquarters Section



Ambulance and Casualty Collecting Section



Welfare Section

The FOURTH Arm

Traditionally, we have three Services in this country: the Royal Navy, the Army, and the Royal Air Force. Now, we have a fourth service of the Crown—unarmed, volunteer, part-time—but not less vital than the others: Civil Defence. We have peacetime Civil Defence for just the same reasons that we have a peacetime Navy, Army and Air Force: it is an essential part of our ordinary peacetime national preparedness. *That is all there is to it.*

WHAT YOU CAN DO IN CIVIL DEFENCE

Five Sections: which will you join?

WARDEN. This is a job for a man or woman with a quick, cool head and the power of leadership—and something of a flair for getting on with people. The Warden takes control of the area in an emergency and directs the other services where they are required.

HEADQUARTERS. This is the nerve-centre, where the reports come in and the orders go out. If you are an officer or scientific worker, a radio 'ham', motor-cyclist or driver—here is interesting, important work that you could train for now.

RESCUE. Members of Rescue Squads are highly skilled. Each man carries a pack containing saw, wrecking-bar, lashing, wire-cutters and First Aid kit—and he is trained in the use of all of them. Backing up the Rescue Squad is a special Rescue Vehicle, with scaffold-poles, cables, winches, stretchers and heavy rescue gear. A rescue man needs intelligence as well as strength.

THE AMBULANCE AND CASUALTY COLLECTING. Section want two sorts of people—casualty collectors, to give First Aid and see that the injured get back safely to the ambulances—and drivers to take the ambulances back to hospital. This is work for both men and women—and if you drive a car already, so much the better.

THE WELFARE Section would be called on first to help in bringing care and comfort to some millions of evacuees. But that is only the beginning of their job. After an attack, there would be more millions of people, to be housed, clothed, fed and kept healthy. Our very survival could depend on what the Welfare Section did then. The Welfare Section needs dependable, intelligent, capable men and women; and it needs them now.

AND THE AUXILIARY FIRE SERVICE, which also has really worth-while, practical training to offer. The work is important; a nuclear explosion sends out an intense heat-wave, and fires would be numerous and quick to spread. The A.F.S. has special nuclear-war fire-fighting apparatus: you would do your training with it.

IN EVERY SECTION YOU GET FIRST AID TRAINING



Rescue Section



Auxiliary Fire Service

Civil Defence Recruiting Drives are going on now, all over the country. Their object is to tell you all about Civil Defence—what it can do, what it IS doing and what there is in it for you.

CIVIL DEFENCE is common sense

Go to your Council Offices and ask, today. They will be glad to see you.

AWRE - T 1/53*Doc. 22/10/54 - SCO 468 refer*

NATIONAL ARCHIVES

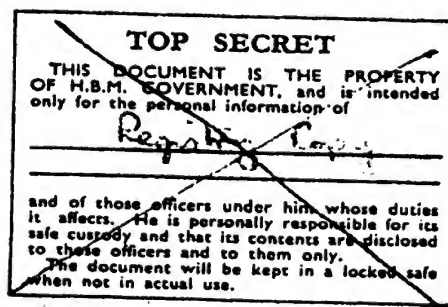
ES5/1

MINISTRY OF SUPPLY

ATOMIC WEAPONS RESEARCH ESTABLISHMENT

REPORT No. T 1/53
(HURRICANE)

B. 0134

DECLASSIFIED FOR PER
BY AWE ALDERMASTON.*Question*

3.2 Blast Damage

Outdoor peak overpressure was 51 psi at 500 yds,
25 psi at 665 yds and 10 psi at 1,000 yds
3 psi extended to 2,000 yds

3.2.1 Anderson Shelters

Standard Anderson Shelters, with sandbag covering and blast wall construction were located at 460, 510, 600, 920 and 1,130 yards from ground zero. Mean blast pressures, in pounds/sq. inch, recorded inside the shelters are shown in the following table.

Distance (yds.)	Presentation		
	Front	Side	Rear
460	NR	NR	NR
510	38	27	40
600	28	21	28
920	16	7	14
1130	8.5	4	5.5

Front presentation implies blast wall facing towards event.
Rear " " " " " away from event.
Side " " shelter side on to event.

Shelters at 460, 510 and 600 yards suffered damage including demolition of blast walls, removal of sandbag covering and some displacement of the corrugated iron.

At 920 and 1,130 yards the shelters suffered relatively little damage.

Civil defence authorities consider that there might have been some 50% survival from blast damage of personnel in shelters at 460 yards and some 90 per cent at 600 yards, fatal casualties being mainly due to secondary blast effects (e.g. debris) and not to direct effects on the person of the blast pressure itself. The front presentation appears the most hazardous, due to the collapse of the blast wall into the shelter. At such distances, however, the survival from the effects of gamma flash would have been virtually nil. (MORE EARTH COVER IS NEEDED FOR RADIATION.)

At 920 and 1,130 yards there would have been no casualties from blast, and incidentally, little risk from the effect of gamma flash.

Type 3 outdoor Anderson shelter

Anderson shelters exposed to Operation Hurricane nuclear test



Anderson shelter with earth cover (not sandbags) and radiation-shielded entrance at Home Defence College, Easingwold, York, 1980.



Earth covered shelter, Hiroshima (U.S. Strategic Bombing Survey)





Real fallout decontamination: Oct 1952, ADM 280/966

ANDERSON SHELTER TESTS AGAINST 25 KT NUCLEAR
NEAR SURFACE BURST (2.7 METRES DEPTH IN SHIP)

AWRE-T1/54, 27 Aug. 1954

SECRET—GUARD

ATOMIC WEAPONS RESEARCH ESTABLISHMENT

(formerly of Ministry of Supply)

SCIENTIFIC DATA OBTAINED AT OPERATION HURRICANE

(Monte Bello Islands, Australia—October, 1952)

12.1. Blast Damage to Anderson Shelters

At 1,380 feet, Fig. 12.1, parts of the main structure of the shelters facing towards and sideways to the explosion were blown in but the main structure of the one facing away from the explosion was intact, and would have given full protection. At 1,530 feet, Fig. 12.2, the front sheets of the shelter facing the explosion were blown into the shelter but otherwise the main structures were more or less undamaged, as were those at 1,800 feet, Fig. 12.3.

Operation Hurricane nuclear test Anderson shelters used sandbags which gave no "earth arching" protection, unlike packed soil cover used over London Anderson shelters, 1940:



13. THE PENETRATION OF THE GAMMA FLASH

13.1. *Experiments on the Protection from the Gamma Flash afforded by Slit Trenches*

13.1.1. The experiments described in this section show that slit trenches provide a considerable measure of protection from the gamma flash. From the point of view of Service and Civil Defence authorities this is one of the most important results of the trial.

13.1.2. Rectangular slit trenches 6 ft. by 2 ft. in plan and 6 ft. deep were placed at 733, 943 and 1,300 yards from the bomb and circular fox holes 2 ft. in radius and 6 ft. deep were placed at 943 and 1,300 yards.

The doses received from the flash were measured with film badges and quartz-fibre dosimeters in order to determine the variation of protection with distance, with depth and with orientation of the trench and the relative protection afforded by open and covered trenches.

In general, the slit trenches were placed broadside-on to the target vessel but at 1,300 yards one trench was placed end-on. Two trenches, one at 733 and one at 943 yards were covered with the equivalent of 11 inches of sand.

TABLE 13.1

Variation of Gamma Flash Dose on Vertical Axis of Trench

Type of trench	Rectangular broadside-on open			Rectan- gular end-on open	Circular open		Rectangular broadside-on covered	
	1,300	943	733	1,300	1,300	943	943	733
Distance (yards) ...	1,300	943	733	1,300	1,300	943	943	733
Surface dose (Roentgens)	300	3,000	14,000	300	300	3,000	3,000	14,000
Depth below ground level (inches)								
6 ...	150	1,000	—	230	214	1,200	(75)	—
12 ...	75	430	—	150	120	545	47·6	—
24 ...	33·3	150	584	60	54·5	188	25	(140)
36 ...	23	70	216	31·6	30	86	13	(56)
48 ...	(20)	43	100	20	17·7	48·5	7·7	(31)
60 ...	—	(37·5)	61	13·6	10·7	(33·3)	5	(23)
72 ...	—	—	(46·7)	(8·6)	7	—	(3·5)	—

Entries in brackets are extrapolations or estimates.



Trench air raid shelter in Kent hop field 15 Aug 1940



Exercise Desert Rock VI (Nevada, 1955), 6 ft trench at 4,000 yds from GZ

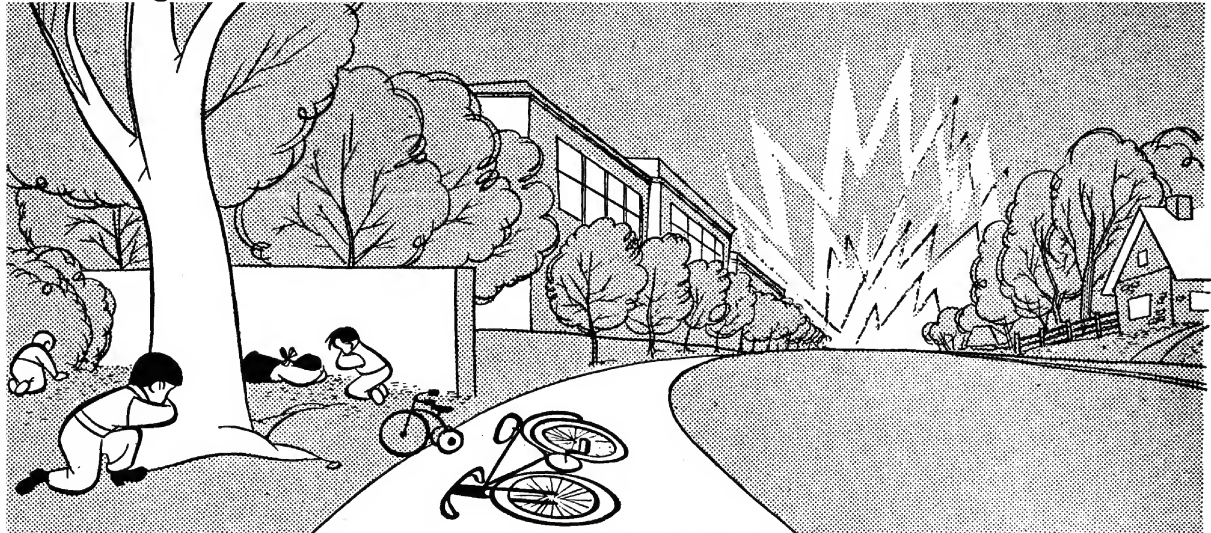
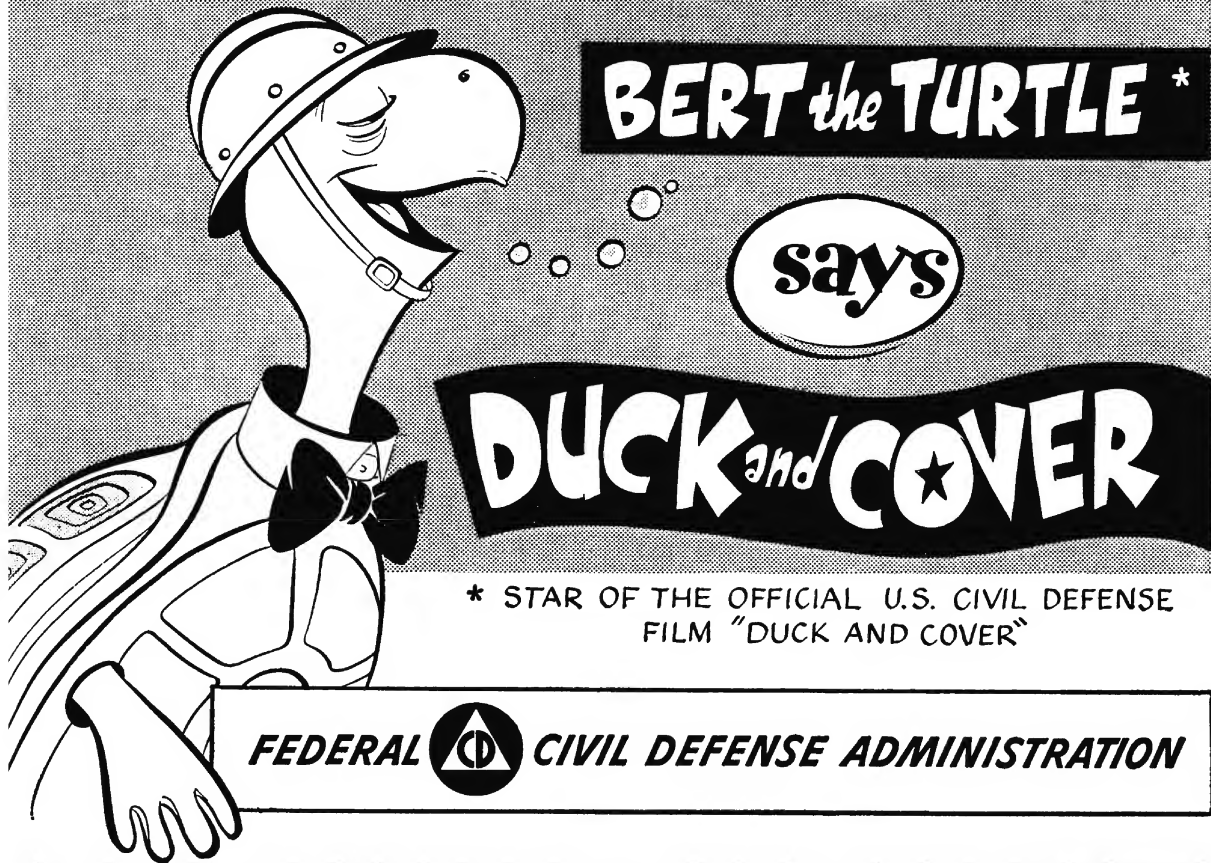


MET shot (1955): road graders survive 30 psi peak overpressure in open trench

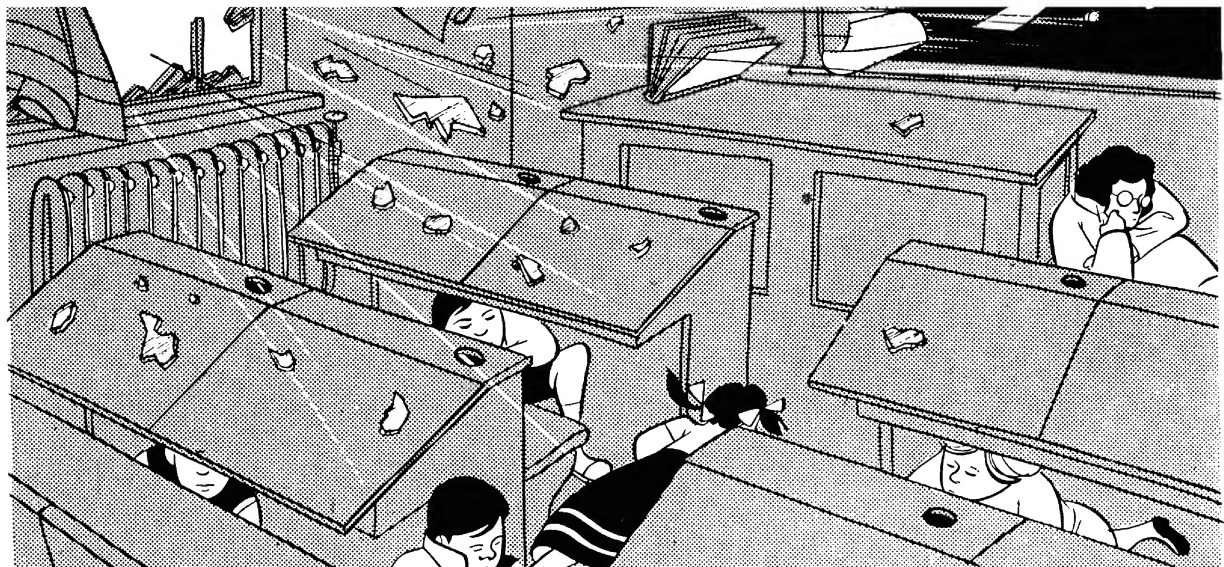
Source: Glasstone, Effects of Nuclear Weapons, 1957



Nevada test site, 8 May 1953: 27 kiloton ENCORE nuclear weapon test



SO, LIKE BERT, YOU **DUCK** TO AVOID
THE THINGS FLYING THROUGH THE AIR...



...AND **COVER** TO KEEP FROM GETTING
CUT OR EVEN BADLY BURNED.

AIR WAR AND EMOTIONAL STRESS

Psychological Studies of Bombing and Civilian Defense

Irving L. Janis
The RAND Corporation
1951

EMOTIONAL IMPACT OF THE A-BOMB

13

Time from flash to blast = 4 sec at 1 mile:

A substantial proportion of the respondents in Hiroshima and Nagasaki reported having reacted immediately to the intense flash alone, as though it were a well-known danger signal, despite the fact that they were unaware of its significance at the time. A number of them said that they voluntarily ducked down or "hit the ground" as soon as the flash occurred and had already reached the prone position before the blast swept over them.

14 *REACTIONS AT HIROSHIMA AND NAGASAKI*

From the above discussion, it is apparent that some of the survivors immediately perceived the flash as a danger signal. It also appears that for those who were not located near the center there was an opportunity to take protective action that could reduce injuries from the secondary heat wave and from flying glass, falling debris, and other blast effects. It is noteworthy that some survivors evidently failed to make use of this opportunity, as is to be expected when there has been no prior preparation for it.

In a later chapter on the problems of civil defense, we shall have occasion to take account of these findings, since they suggest that casualties in an A-bomb attack might be reduced if the population has been well prepared in advance to react appropriately to the flash of the explosion.

HIROSHIMA

John Hersey

NEW YORKER of 31 August, 1946

I

A NOISELESS FLASH

AT exactly fifteen minutes past eight in the morning, on August 6th, 1945, Japanese time, at the moment when the atomic bomb flashed above Hiroshima,

Dr. Terufumi Sasaki, a young member of the surgical staff of the city's large, modern Red Cross Hospital, walked along one of the hospital corridors

He was one step beyond an open window when the light of the bomb was reflected, like a gigantic photographic flash, in the corridor. He ducked down on one knee and said to himself, as only a Japanese would, "*Sasaki, gambare ! Be brave !*" Just then (the building was 1,650 yards from the centre), the blast ripped through the hospital. The glasses he was wearing flew off his face; the bottle of blood crashed against one wall; his Japanese slippers zipped out from under his feet—but otherwise, thanks to where he stood, he was untouched.

Dr. Sasaki shouted the name of the chief surgeon and rushed around to the man's office and found him terribly cut by glass.

Starting east and west from the actual centre, the scientists, in early September, made new measurements, and the highest radiation they found this time was 3.9 times the natural "leak."



A

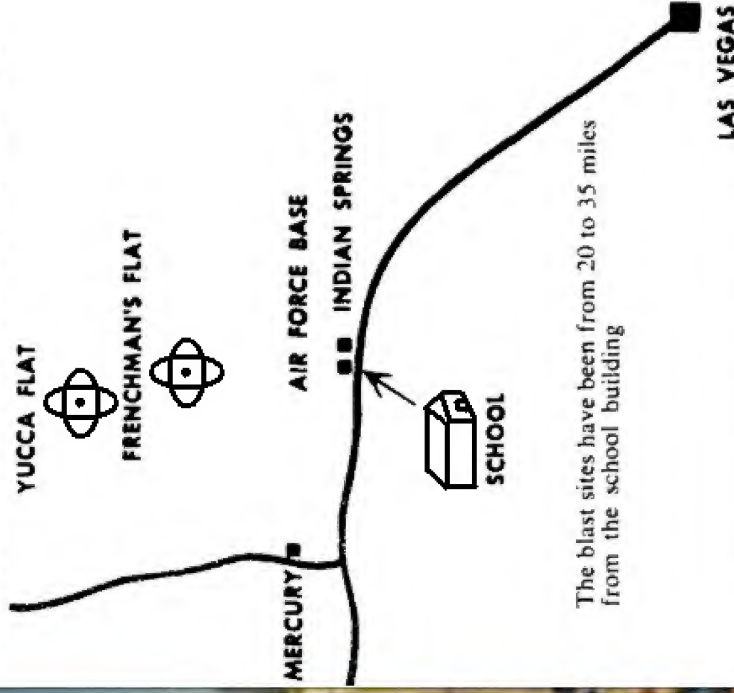
IS FOR ATOM

By ROBERT CAVIN

A dozen times, the awesome mushroom has risen in view of these youngsters, 25 miles from the Nevada test sites. Here's the story of our most atom-wise kids ▶

Collier's Weekly, June 21, 1952, pp. 15-17

Indian Springs (whose permanent population is 17) and adjacent air base are 42 miles from Las Vegas



The blast sites have been from 20 to 35 miles from the school building

SEVERAL months ago, the people of the nation learned with some interest that for the first time combat troops were to witness an atomic bomb test from close up. But to the youngsters at Indian Springs Public School, near Las Vegas, Nevada, such an experiment was old-hat. They already had seen, from less than 25 miles away, more atomic bomb blasts than anyone in the world except for the handful of nuclear scientists and technicians who set them off.

Starting last October, when the influx of atomic, military and construction personnel brought more than 200 families into the area, the Indian Springs school had become an unplanned experiment in the indoctrination of young children to atomic bombs.

"The children at this school, by their sheer proximity to the tests, are getting the same type of psychological indoctrination we are giving some of our combat troops," an Atomic Energy Commission spokesman commented recently. "If all the school children in the nation could witness an A-bomb blast, it would do much to destroy the fear and uncertainty which now exist."

Eighth-grader Dick Bower, thirteen, says he was once told at an atomic bomb drill in a southern California school that there was a possibility the whole earth could be blown up if enough such bombs were exploded. "I was really scared when we moved up here," Dick says, "but I have seen a couple of bombs go off now and it's just ordinary."

DOMESTIC NUCLEAR SHELTERS

Advice on
domestic shelters
providing protection
against
nuclear explosions



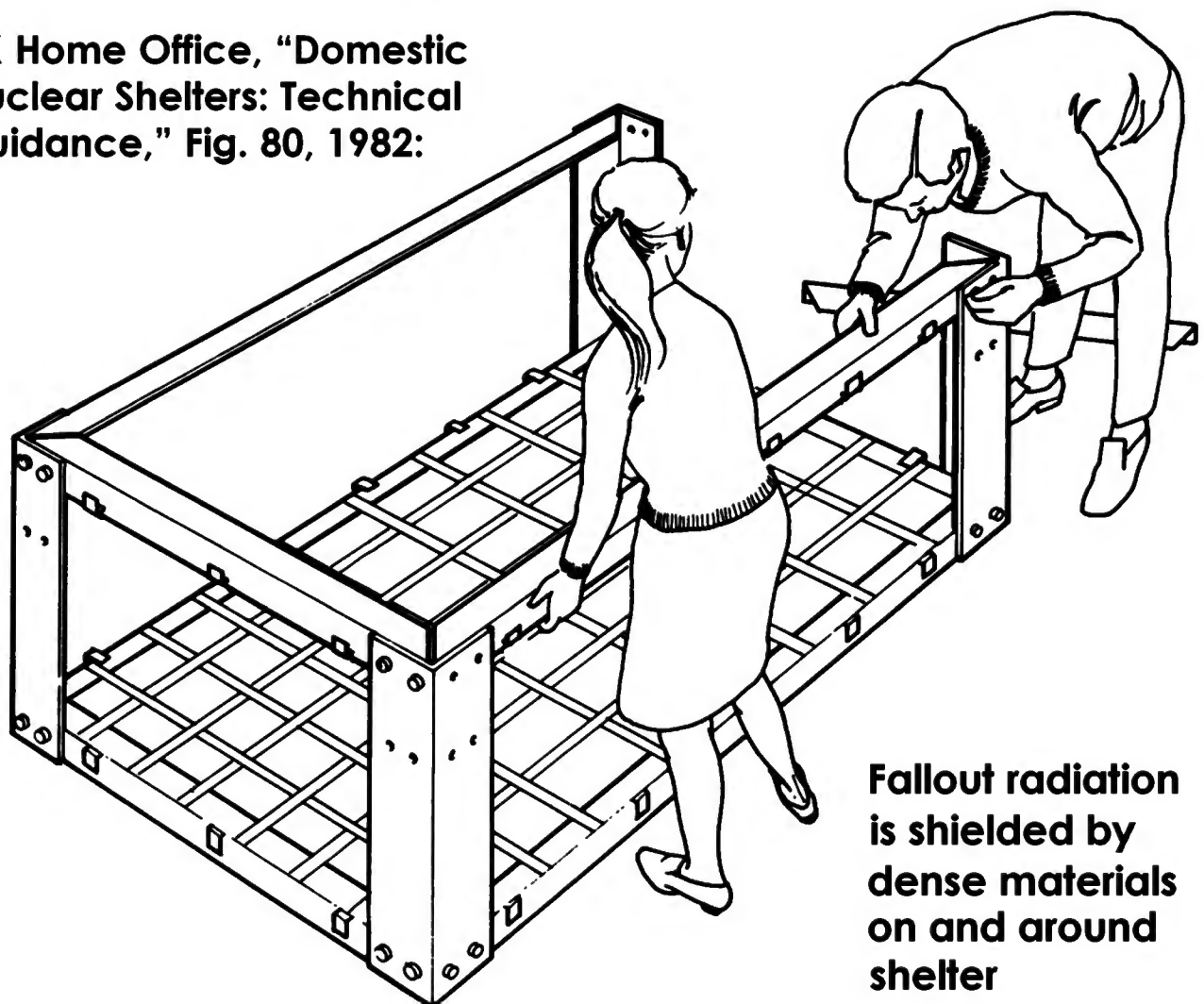
A Home Office guide

Type 2 indoor Morrison shelter

UK Ministry of Home Security, "How to Put Up Your Morrison 'Table' Shelter," Fig. 3, 1942:

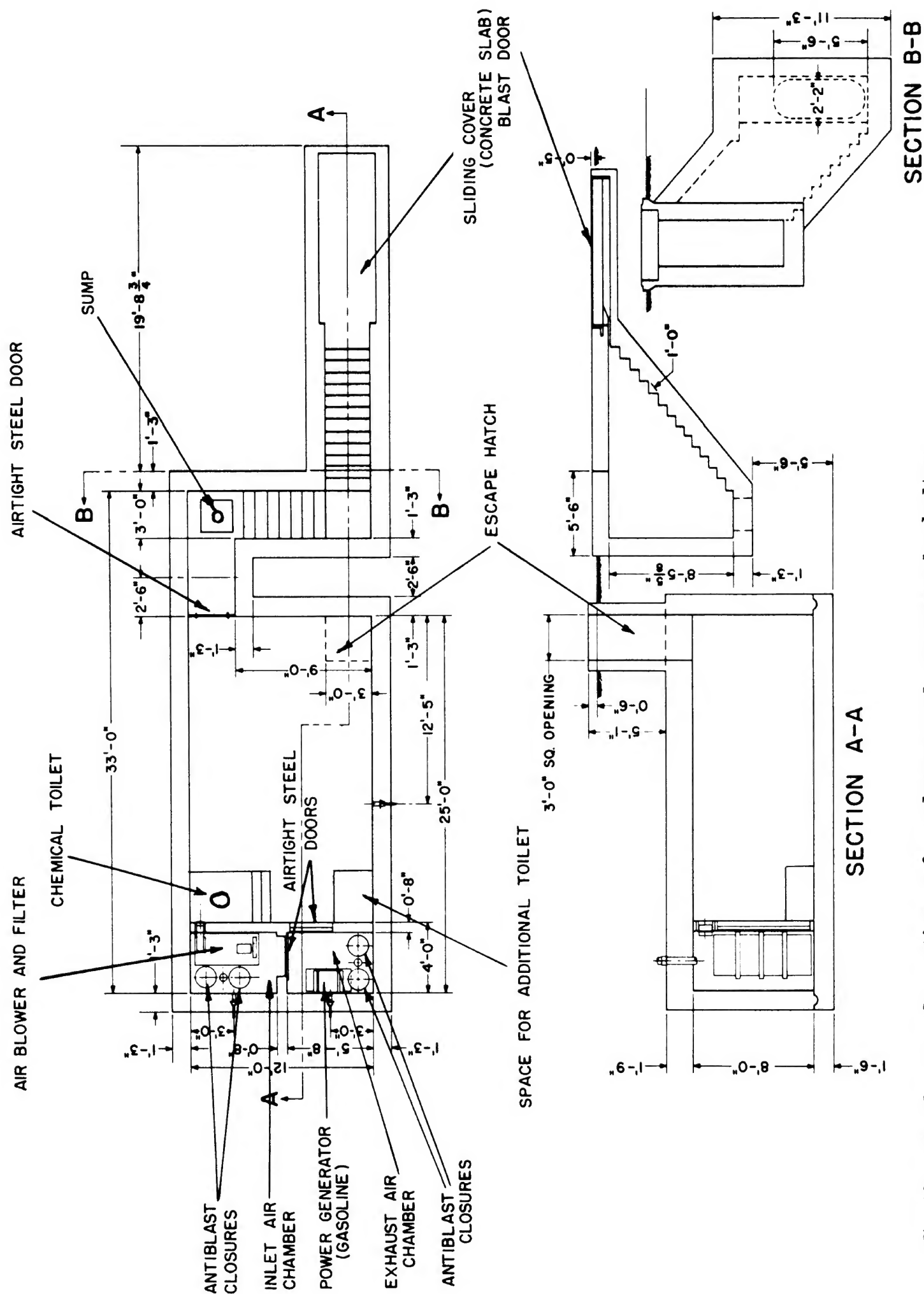


UK Home Office, "Domestic Nuclear Shelters: Technical Guidance," Fig. 80, 1982:



Fallout radiation is shielded by dense materials on and around shelter

**Type 4 reinforced concrete shelter (Nevada bomb test)
Fig. 12.54 in Glasstone Effects of Nuclear Weapons, 1957**

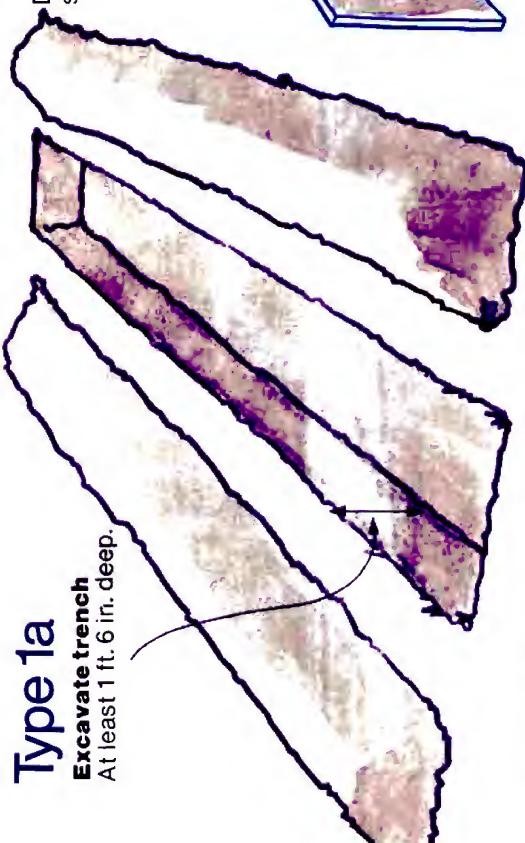


Sectional plan and section of underground personnel shelter

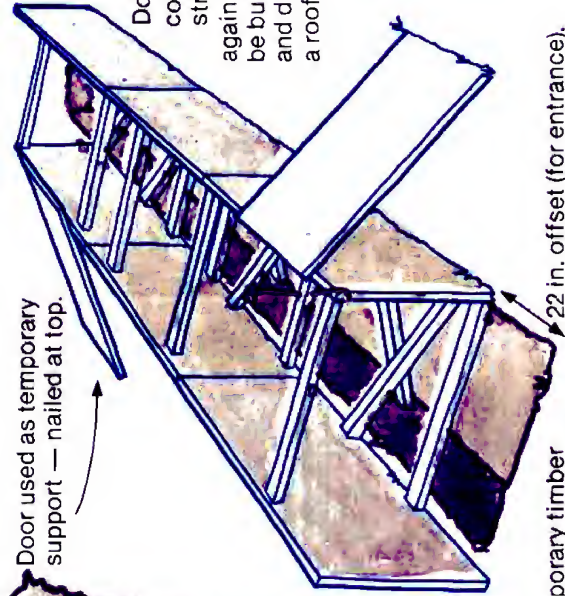
Type 1a

Excavate trench

At least 1 ft. 6 in. deep.



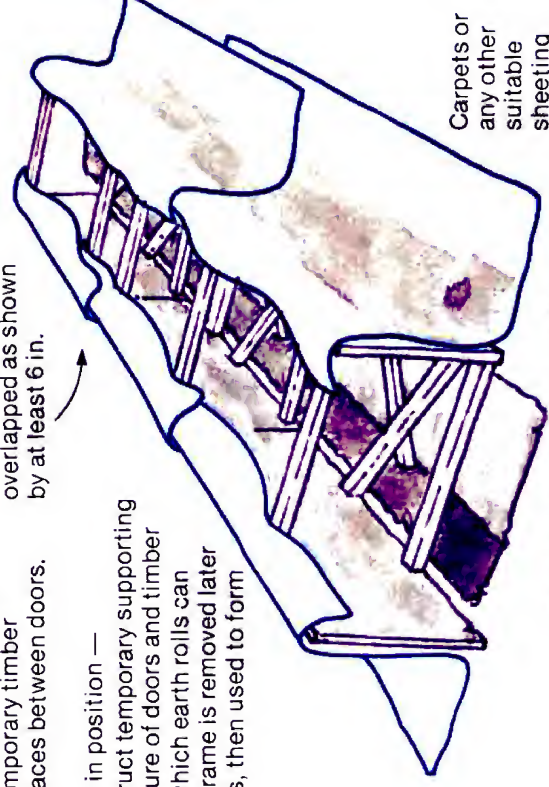
Spread spoil on both sides of trench, at least 2 ft. from the edge.



40 in. by 4 in. by 2 in. temporary timber braces between doors.

Doors in position — construct temporary supporting structure of doors and timber against which earth rolls can be built (frame is removed later and doors, then used to form a roof).

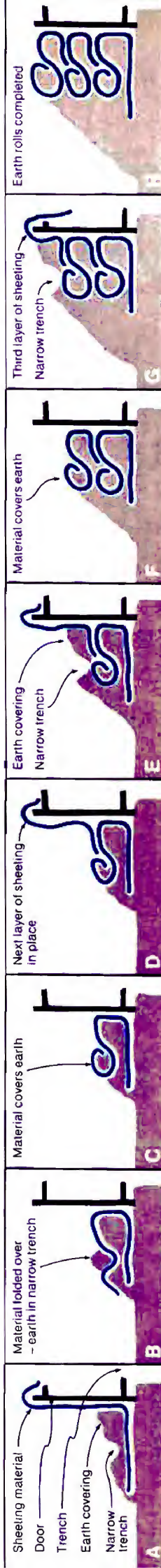
Material should be overlapped as shown by at least 6 in.



Carpets or any other suitable sheeting materials.

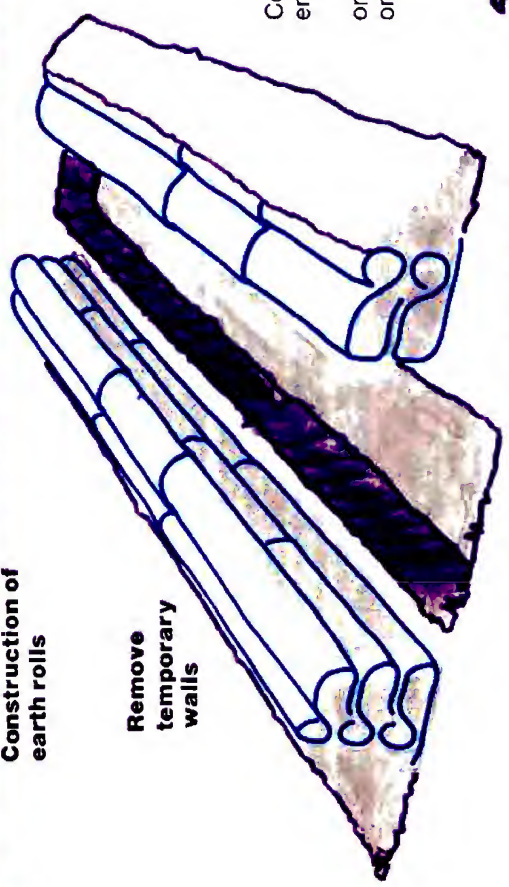
Position sheeting material

Construct temporary walls



Construction of earth rolls

Remove temporary walls



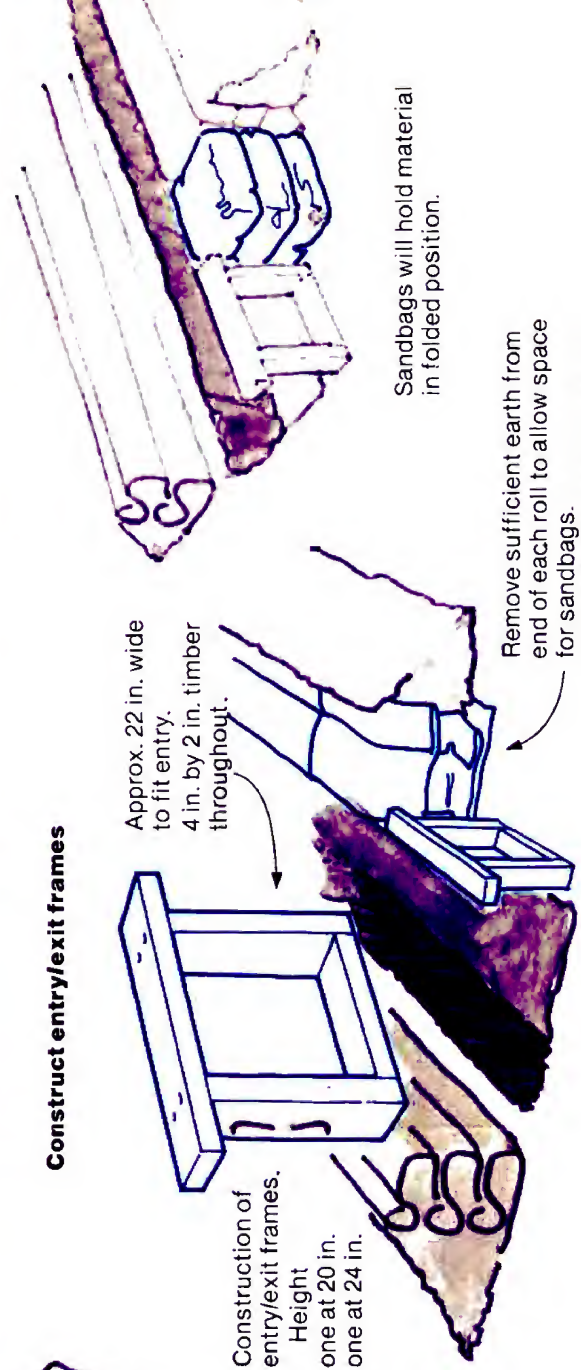
Two 10 in. high rolls (total height 20 in.).

Three 8 in. high rolls (total height 24 in.).

Construct entry/exit frames

Approx. 22 in. wide to fit entry. 4 in. by 2 in. timber throughout.

Construction of entry/exit frames. Height one at 20 in. one at 24 in.



Sandbags will hold material in folded position.

Remove sufficient earth from end of each roll to allow space for sandbags. Fold material over to seal end.

During construction

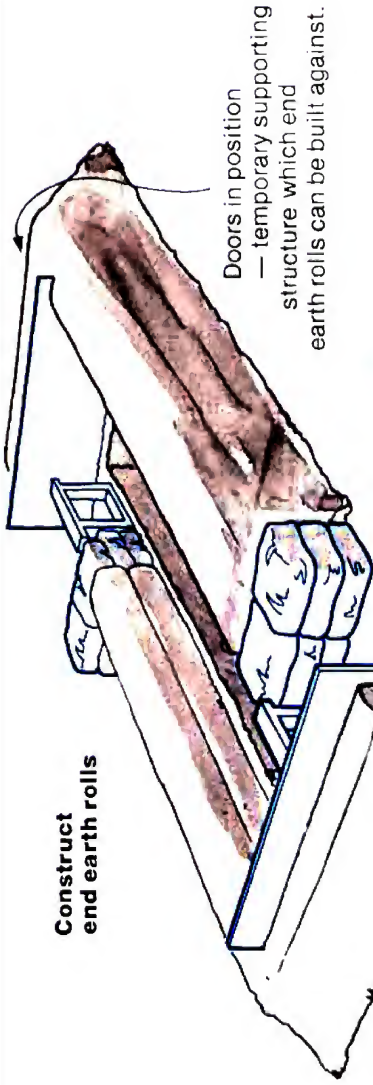


**Type 1a earth-covered doors-over trench shelter
Home Office Scientific Advisory Branch (Home
Defence College, Easingwold, York, 1980)**

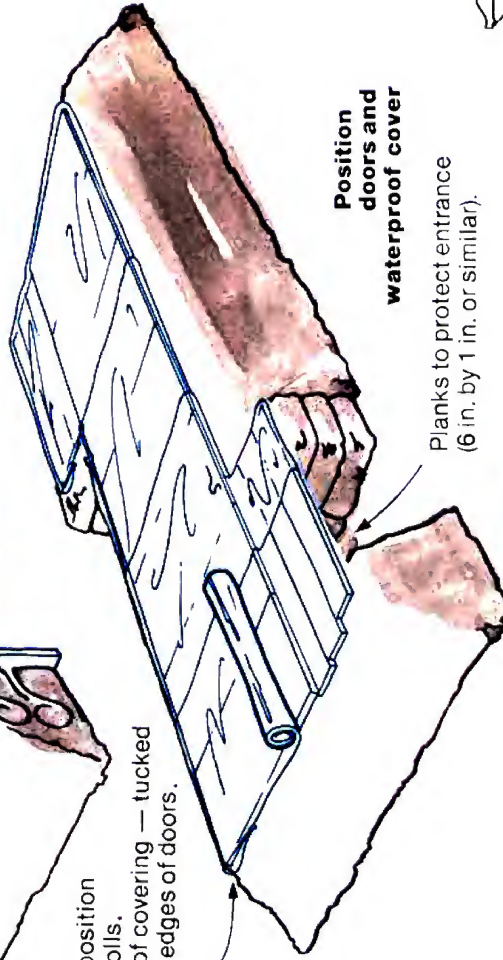
Type 1b

Improved outdoor shelter

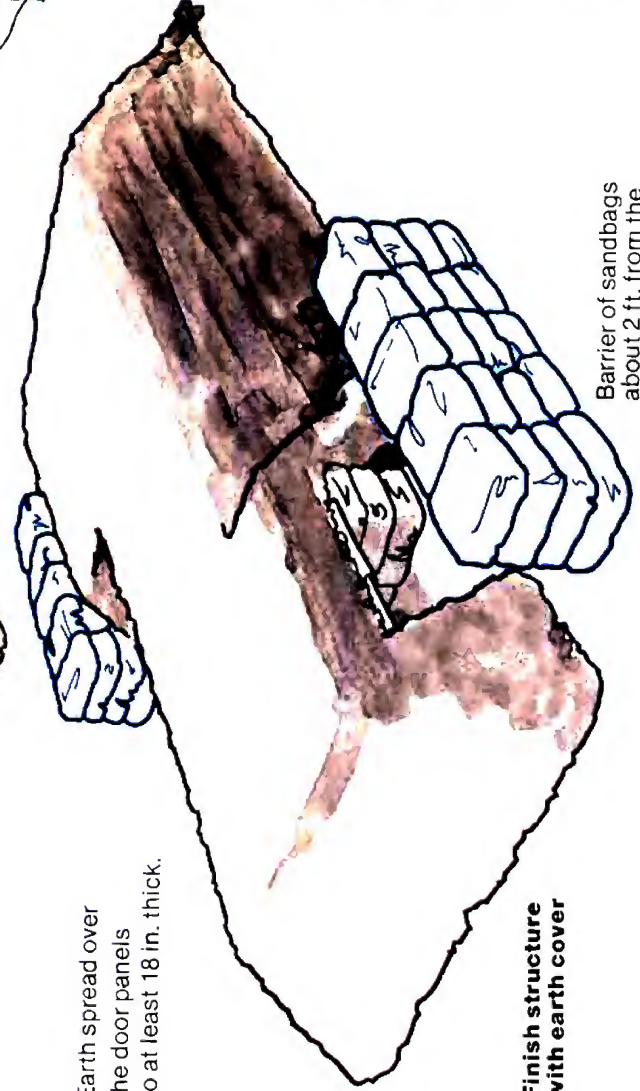
Construct end earth rolls



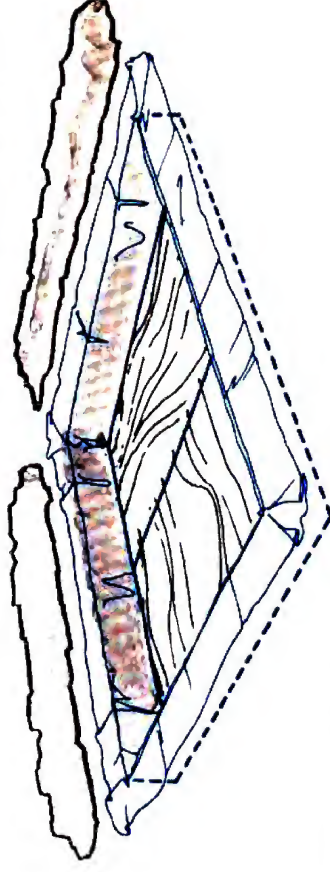
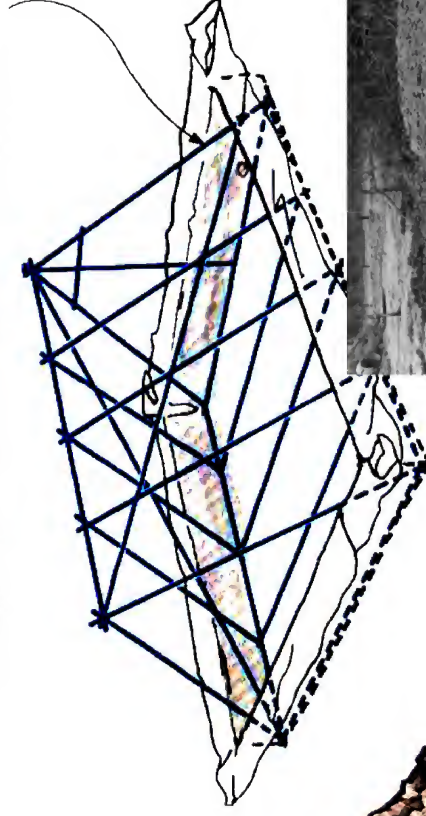
Doors in position on earth rolls. Waterproof covering — tucked under the edges of doors.



Earth spread over the door panels to at least 18 in. thick.



Construct the frame of scaffold poles (or you could use wood). This should be as strong as you can make it. You can increase the strength with vertical and diagonal bracing, or crossbars.



**Type 1b
earth-covered
scaffold/wood
pole A-frame
shelter, in 1980 at
Home Defence
College,
Easingwold, York**



It cannot be too strongly emphasised that it is most important, from the point of view of reducing casualties as a whole, for everyone in an area under attack to make use of any shelter that is available. Recent research has shown that there would be less fatal casualties if everyone were in relatively poor shelter than if half the population were in shelter twice as good and the other half remained in the open.

THE RISK OF BECOMING A CASUALTY

(Basic Methods of Protection Against High Explosive Missiles - Manual of Basic Training, Civil Defence, vol. 2, Pamphlet 5, H.M.S.O., 1951)

**STANDING IN
THE OPEN OR
IN A STREET**

**LYING DOWN
IN THE OPEN
OR IN A
STREET**

**LYING BEHIND
LOW COVER OR
IN A DOORWAY**

**SHELTER IN A
BRICK HOUSE
AWAY FROM
WINDOWS**

**IN TRENCHES,
GOOD SURFACE
SHELTERS, OR
STRUTTED
BASEMENTS**



IN SHELTER



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HOME OFFICE

OFFICE OF THE CHIEF SCIENTIFIC ADVISER

A COMPARISON BETWEEN THE NUMBER OF PEOPLE KILLED PER TONNE OF BOMBS DURING WORLD WAR I AND WORLD WAR II

BOMB SIZES

=> ~ 175 kg

For World War II the average bomb weight was between 150 - 200 kg. (R.C. 268, Table 6), whereas for World War I the majority of bombs were 12 or 50 kg.

TABLE 5

Relative safeties in World War II deduced from
population and casualty distribution

	In the open	Under cover	In shelter
Population exposure	5%	60%	35%
Location people killed	19%	62%	19%
Relative safety	72%	20%	10%
RELATIVE DANGER!			

- (1) A house about $3\frac{1}{2}$ times as safe as in the open.
- (2) A shelter about twice as safe as a house.

Table 6 also shows the location of killed which is implied by each of the possible population exposures. The only evidence available on this point is that, for the day raid on June 13th, 1916, in which the total number killed was 59, 69.5% of the people killed in the City were in the open.

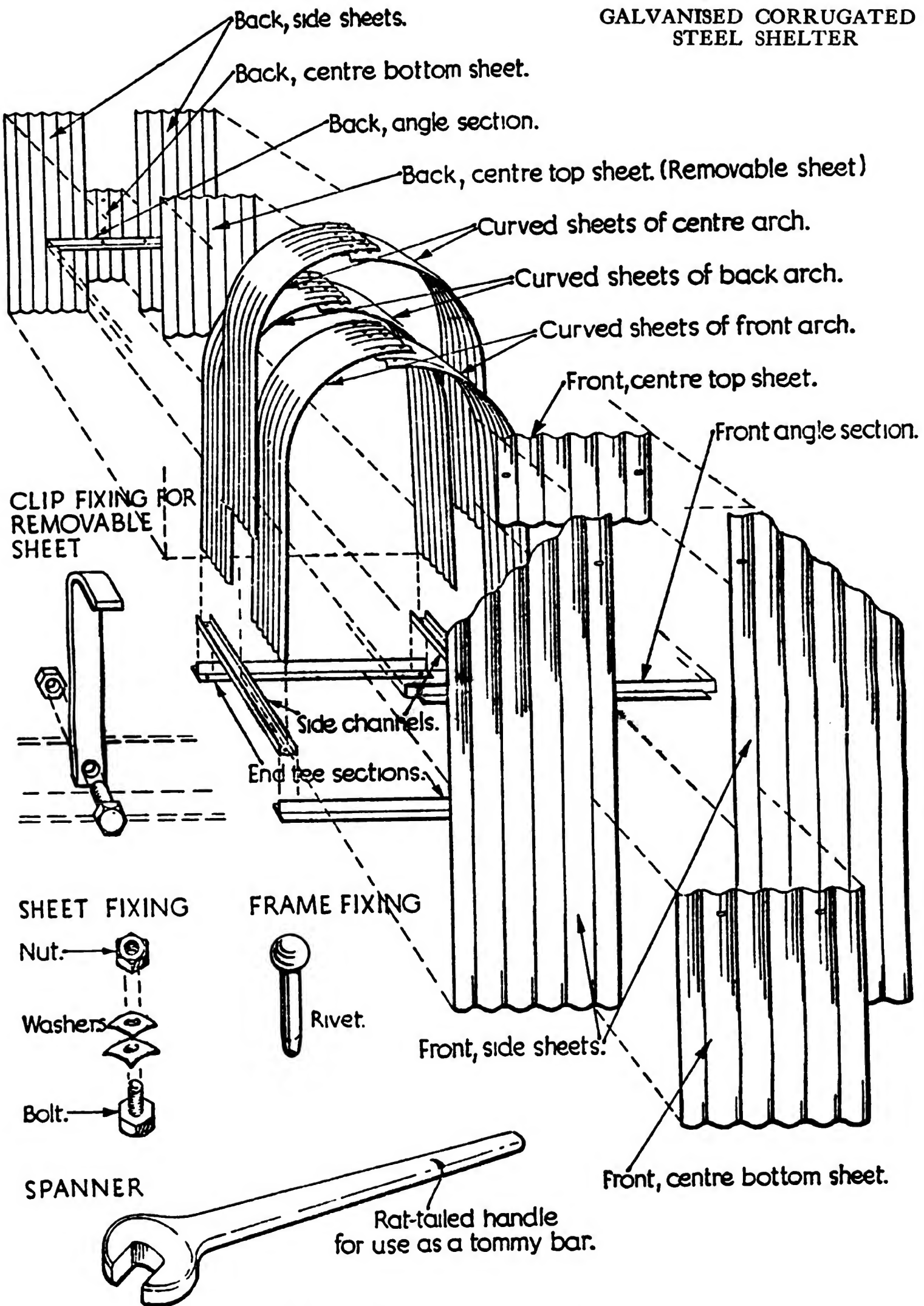


**DAMAGE CRITERIA FOR SHALLOW BURIED OR EARTH COVERED
SURFACE STRUCTURES**

Type of structure	Damage class	Peak over-pressure (psi)	Nature of damage
Light, corrugated steel arch, surface structure (10-gage corrugated steel with a span of 20 to 25 feet) with 3 feet of earth cover over the crown.	A	35-40	Complete collapse.
	B	30-35	Collapse of portion of arch facing blast.
	C	20-25	Deformation of end walls and arch, possible entrance door damage.
	D	10-15	Possible damage to ventilation system and entrance door.

SOURCE: DR SAMUEL GLASSTONE,
THE EFFECTS OF NUCLEAR WEAPONS,
U.S. DEPARTMENT OF DEFENSE, 1957

GALVANISED CORRUGATED STEEL SHELTER



ANDERSON SHELTER

Gabriel.



"We believe that most British would prefer a less effective protection at their homes even though this may make no pretence of warding off direct or near hits of bombs..."

Quotation (believe it or not) from Hailley report supporting Sir John Anderson's 'Dig Kinnels'

IF WAR SHOULD COME!



ILLUSTRATED LONDON NEWS—Aug. 24, 1940

GIVING THE LIE TO GOEBBELS: MRS. E. CULLEN SMILINGLY LEAVING THE EMERGENCY
EXIT—A BOMB HAVING BLOCKED THE SHELTER ENTRANCE. (*Planet.*)



—ILLUSTRATED LONDON NEWS—Aug. 24, 1940—

MR. AND MRS. SHERMAN, OF CROYDON, WITH THEIR BABY, BY THEIR SHELTER,
ON EACH SIDE OF WHICH BOMBS BURST. (G.P.U.)



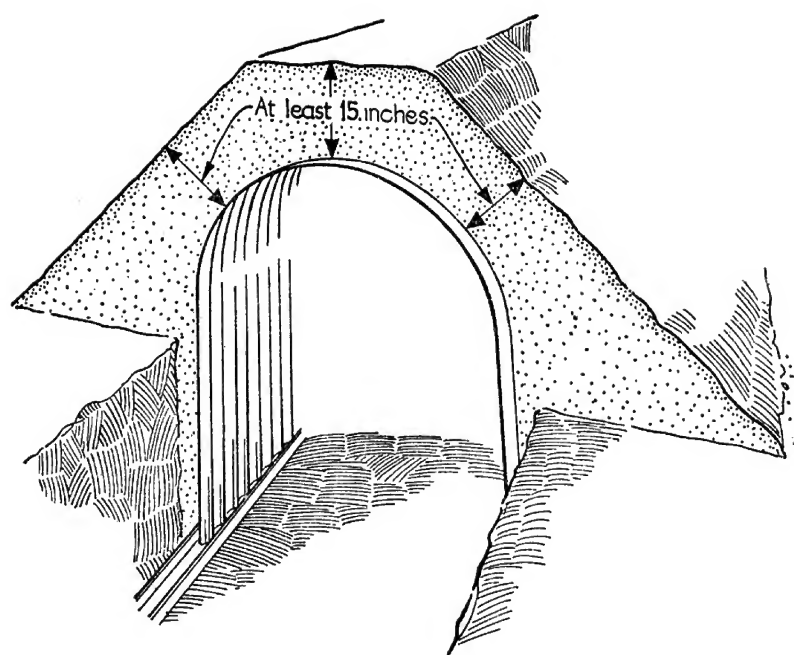


Anderson shelter survives, Croydon, October 1940

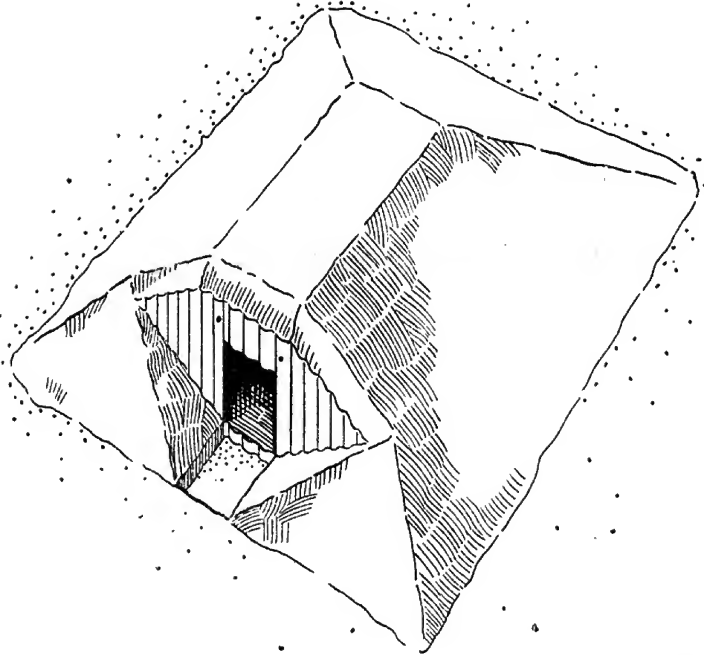




29 July 1944: St Johns Rd, London, Mr and Mrs Dermott and Sgt Harrington



COVERING THE SHELTER WITH EARTH.

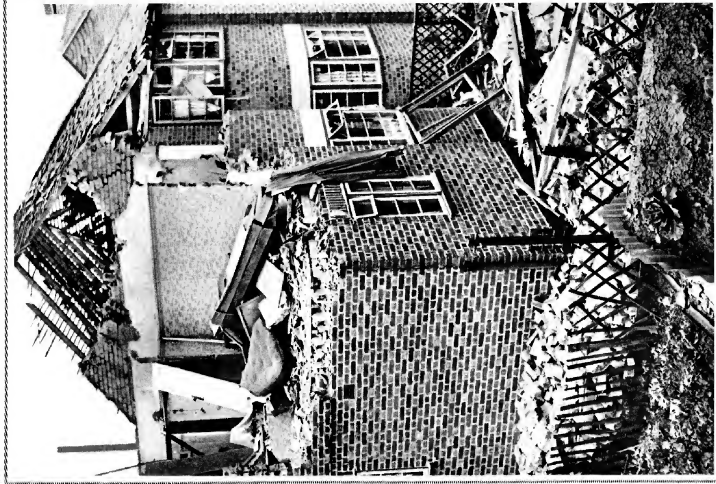


THE SHELTER COMPLETE WITH EARTH COVER.

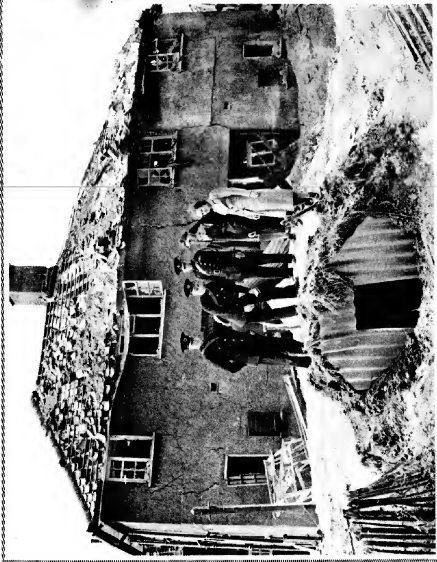
Anderson shelter survives hit: Norwich 27 April 1942



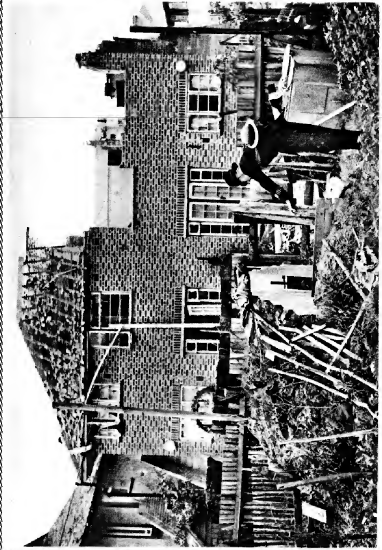
AFFORDING STRIKING PROOF OF THE EFFICACY OF ANDERSON SHELTERS: ALMOST MIRACULOUS ESCAPES IN MIDLAND AND SOUTH OF ENGLAND HOMES.



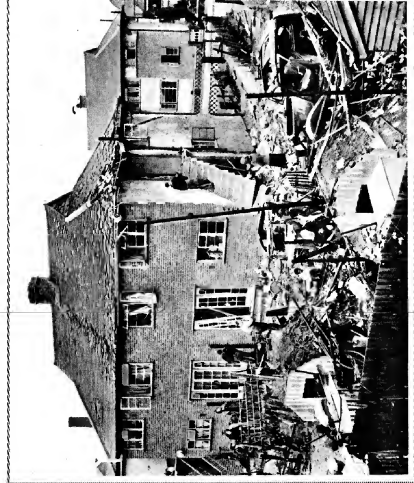
AN ANDERSON SHELTER, CORRECTLY COVERED WITH EARTH (FROM WHICH CABBAGES SPROUT), UNHARMED DESPITE SURROUNDING BOMB DAMAGE. *Wells World.*



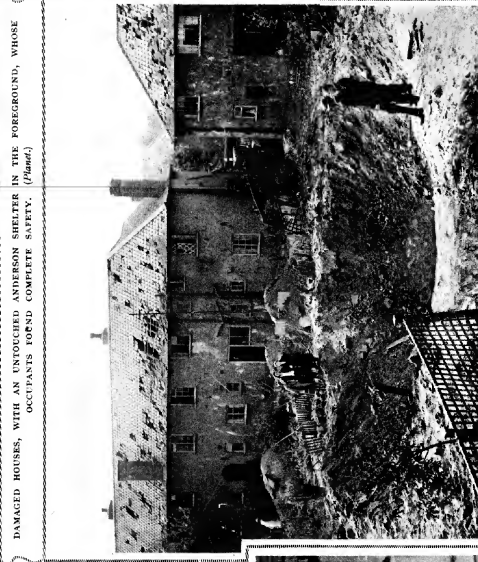
DAMAGED HOUSES, WITH AN UNTOUCHED ANDERSON SHELTER IN THE FOREGROUND, WHOSE OCCUPANTS TOOK COMPLETE SAFETY. *(Pamflet.)*



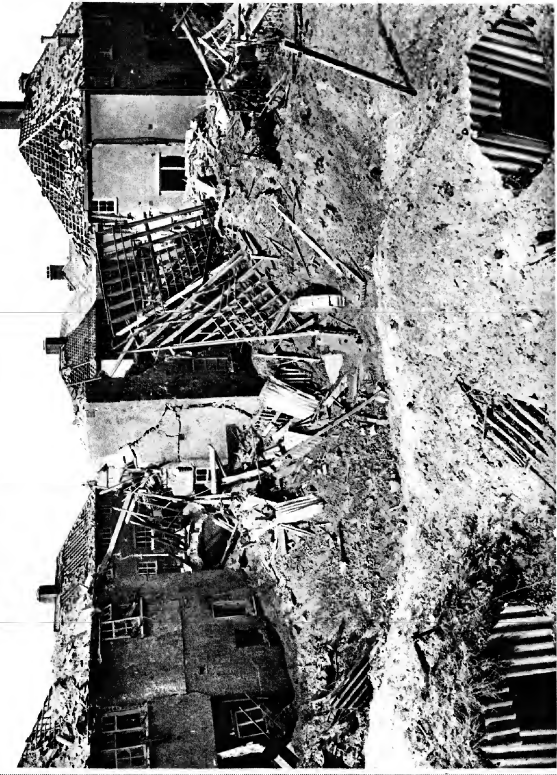
INTACT AMONG THE DEBRIS CAUSED BY GERMAN BOMBS: AN ANDERSON SHELTER IN A S.W. LONDON SUBURB. *(Pamflet.)*



TWO ANDERSON SHELTERS IN THE SAME DISTRICT AS THAT SHOWN IN THE PHOTOGRAPH ON THE LEFT, ALSO INTACT. *(Pamflet.)*



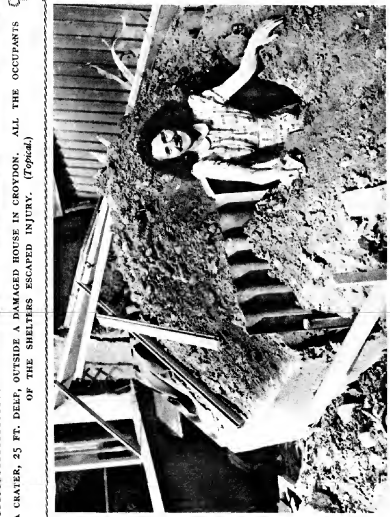
A LARGE BOMB-CRATER BEHIND A ROW OF DAMAGED HOUSES AFTER THE CROYDON RAID: THE SHELTERS WERE UNAFFECTED. *(Krymco.)*



AN UNDAUNTED MIDLAND FAMILY, DUG OUT AFTER A BOMB HAD BURST BEHIND THEIR SHELTER—WHICH SAVED THEM. *(L.P.)*



MR. AND MRS. SHERMAN, OF CROYDON, WITH THEIR BABY, BY THEIR SHELTER, ON EACH SIDE OF WHICH BOMBS BURST. *(G.P.U.)*



GIVING THE LIE TO GORBELLS: MRS. E. CULLEN SMILINGLY LEAVING THE EMERGENCY EXIT—A BOMB HAVING BLOCKED THE SHELTER ENTRANCE. *(Pamflet.)*

THE violent and very expensive raids by the Luftwaffe in the week ending August 17 provided a striking proof of the efficacy of the Anderson shelter when it has been properly covered with earth and the entrance adequately screened. Both at Croydon and in the Midlands its value was proved. When a bomb dropped in the middle of a house, it killed three people and injured a Midlands housewife, but the occupants of all escaped unhurt. Seven people taking cover in a home-made shelter, however, were killed. Seven persons sheltering in an Anderson shelter in another Midlands area were unharmed by a bomb which fell on a housing estate. Five children, aged between three and five, and two blew out the sides of a council house, but the occupants were in their Anderson shelter, less than ten yards away, and were unhurt. One man in South London, with his family, was killed by a bomb which fell from Folkestone, said that they were in an Anderson shelter during the raid on August 18 when five bombs fell within a distance of 100 yards. "Our little shelter trembled," he said, "but we suffered no shock and no damage. The bomb splinters penetrated the back of the other hand, people in an Anderson shelter in the South-Western suburbs were injured by bomb splinters penetrating the back of the shelter, which was not completely covered with earth.



15 Sept 1940: Anderson shelter occupants survived air raid, Ransome Way, Liverpool



Anderson shelter occupants survive air raid destruction at Purfleet



17 June 1944: Anderson shelter absorbs blast from V1 at Elsenham Rd, East End, London



Family survive without injury in wrecked Anderson shelter (note earth blown off) during London Blitz in 1940. Damage to the shelter absorbed the blast energy.



28 Jan 1945: Priory Road, East Ham



27 April 1944: Anderson shelter occupants survive at Forest Drive, East End, London

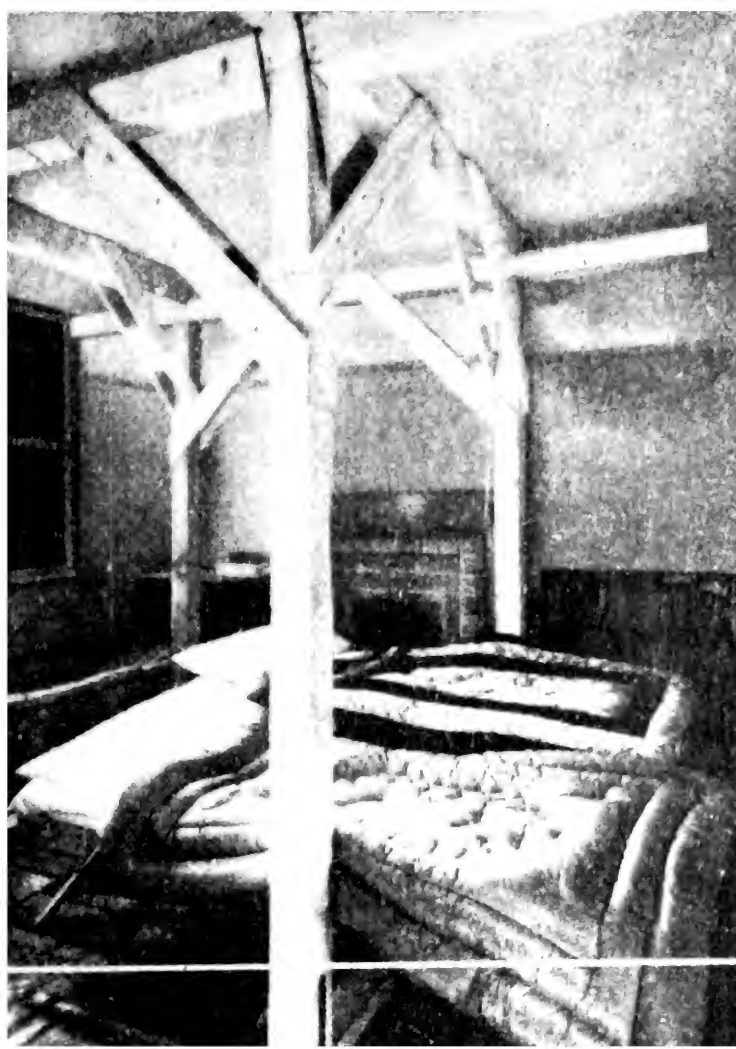


10 July 1944: Anderson shelter occupants survive air raid at Harcourt Avenue, East End, London

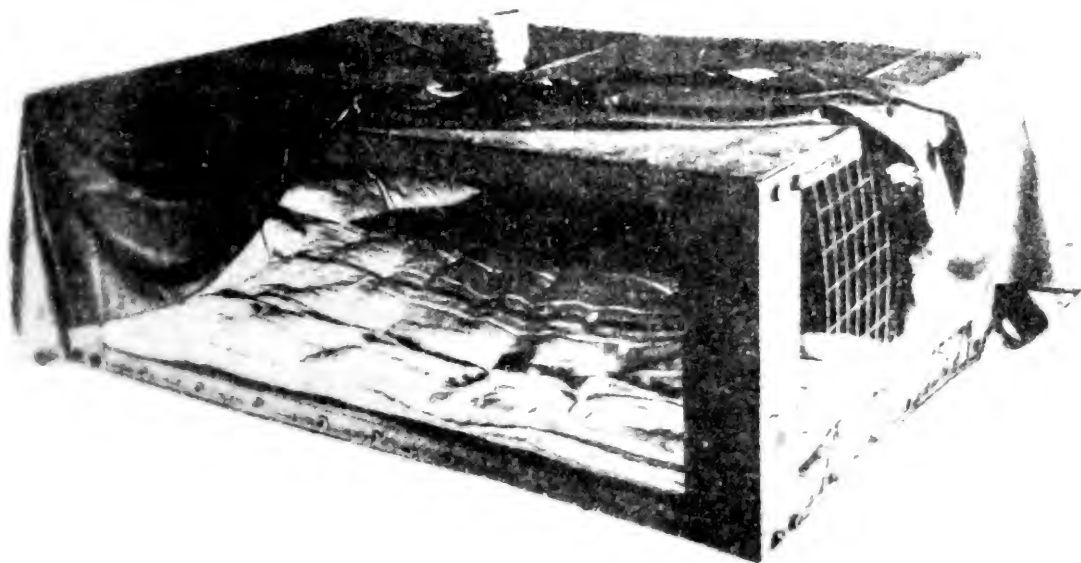


17 July 1944: Anderson shelter occupants survive at Tennyson Ave, Plashet Grove

June 1941



SHELTER at home



3d.

ISSUED BY THE MINISTRY OF HOME SECURITY
AND PUBLISHED BY H.M. STATIONERY OFFICE

Introduction

Not everyone wants to leave home for shelter. Some people can't. Lots of people just prefer to remain in their own house anyway. This inclination is a natural one. It is a sound instinct too, if some protection can be found against the collapse of walls and ceilings.

Shelter indoors allows you to sleep at night in reasonable security and in the warmth and comfort of your house. It also provides handy cover should there be a sudden raid in the day time.

A direct hit cannot be guarded against in any form of home shelter, but the risk of such a direct hit is very small compared with that of a bomb bursting near enough to damage the house or to demolish it. Protection can be obtained in a house even if a bomb demolishes most of it.

The walls, floors and roof of an ordinary house give quite a lot of protection against splinters and blast from a bomb. The idea of an indoor shelter is to make use of this protection and to add safeguards against the other effects of bombs.

The chief of these is the danger of the house falling down. People have often been rescued unhurt from the ruins of demolished houses because they had taken shelter under staircases, or tables, that had by chance been strong enough to protect them from the falling ruins of the house. The chief purpose of the indoor shelters described in this pamphlet is to protect the occupants against injury when the bedroom floor, the roof and other débris fall on them.

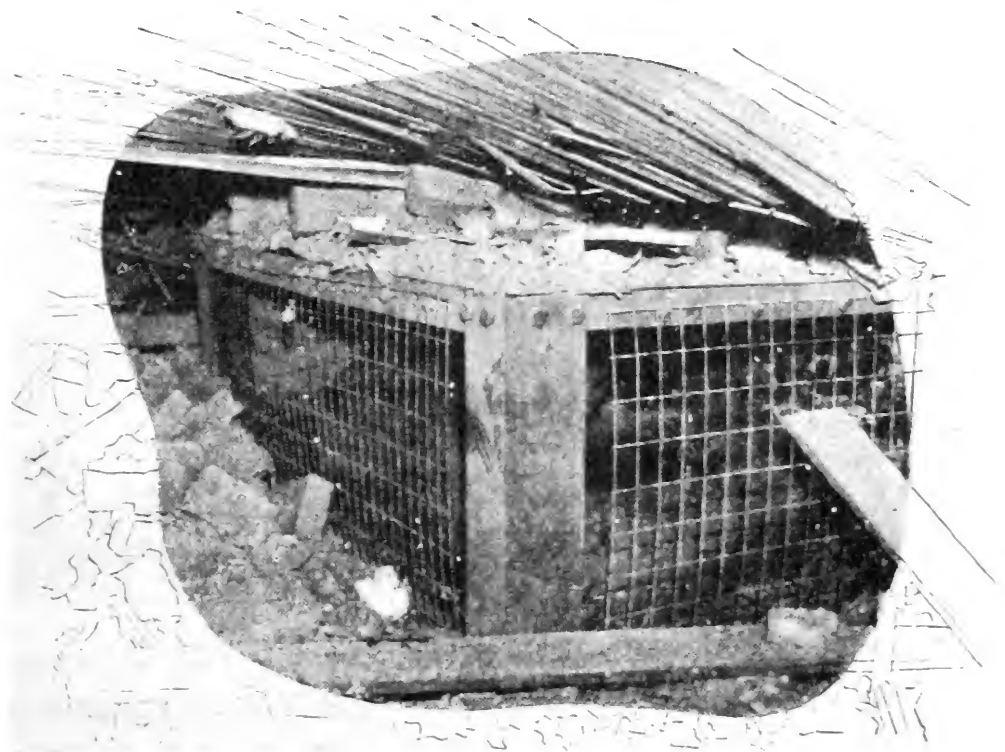
They do not provide such easy emergency escape as a garden shelter, but if you are trapped they protect you from the débris till the Rescue Party releases you. Very often, however, though the house has fallen you will be able to release yourself and walk out.

The indoor shelters with which this pamphlet deals are unsuitable for houses with more than two storeys above the shelter room. They are intended chiefly for use in ordinary two-storey houses, but have a margin of strength that will take the weight of an extra storey.



ILLUSTRATION NO. 8.

The house in the upper photograph had a Government steel table shelter in a downstairs room and was blown up to reproduce the effect of a heavy bomb falling near. The whole house collapsed, burying the shelter under débris. In the lower photo the shelter can be seen still intact. It would have been possible for anyone in the shelter to get out unaided.



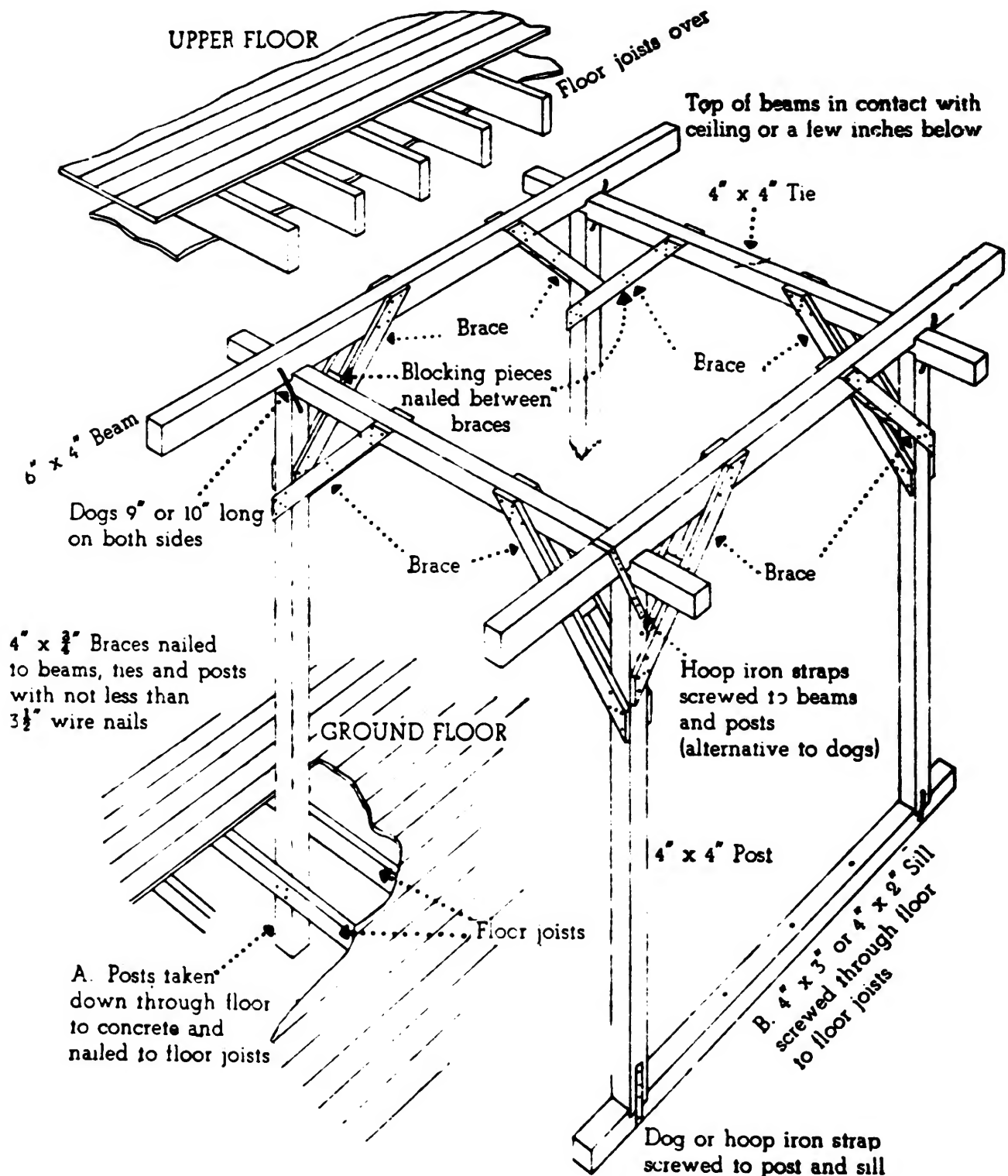
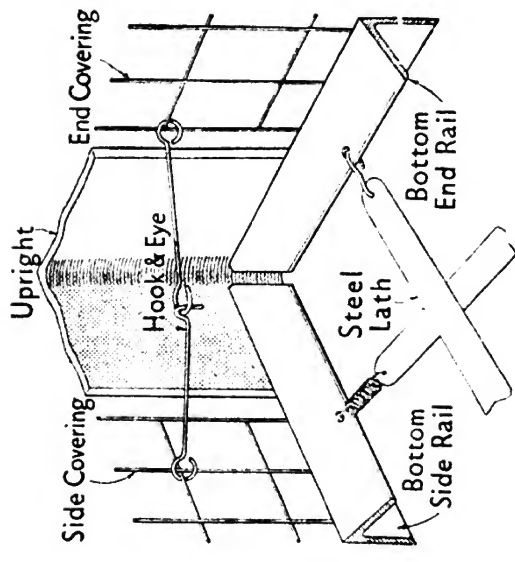
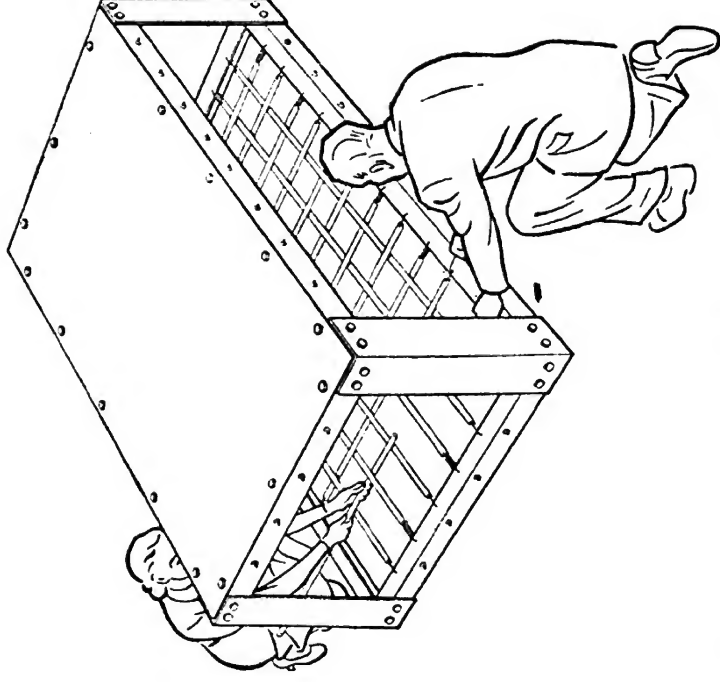
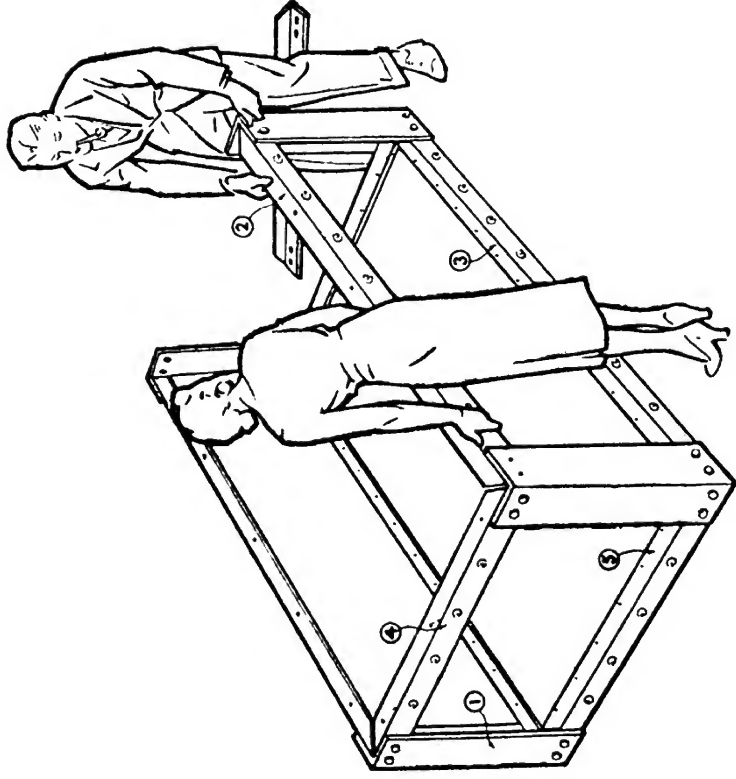
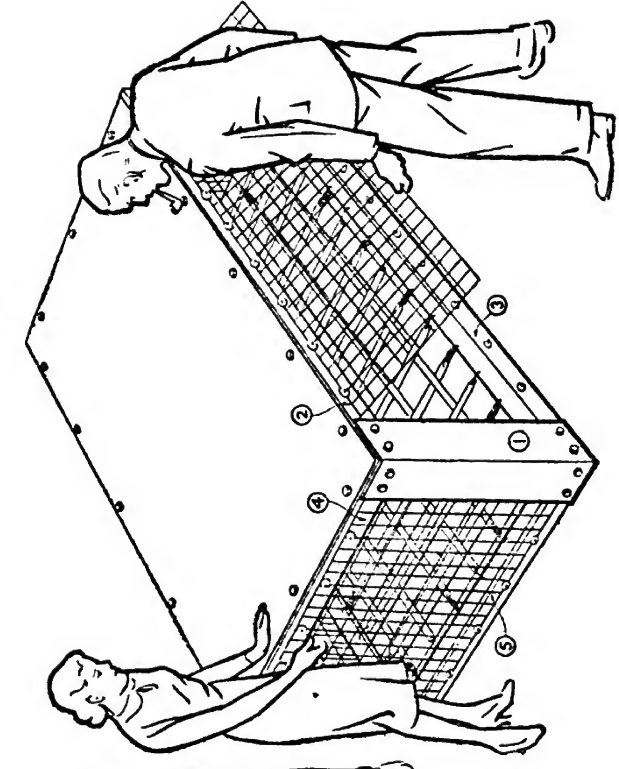
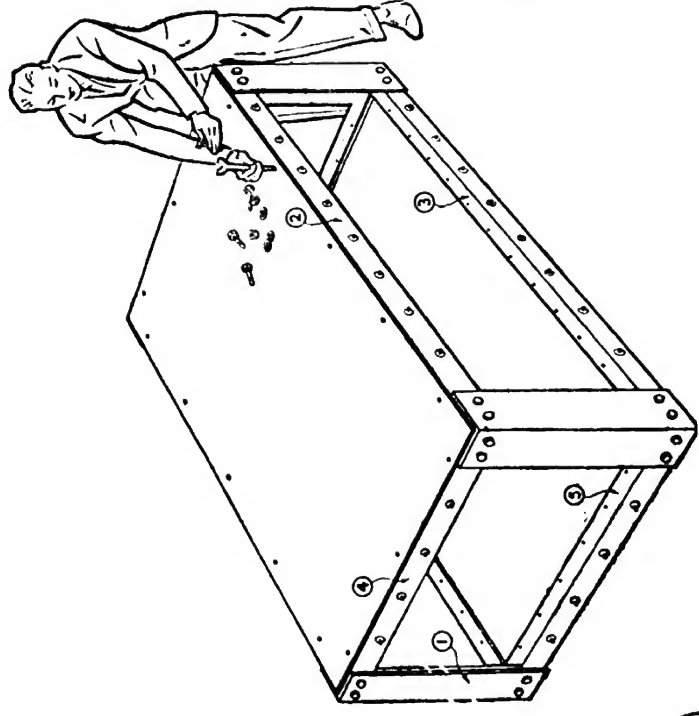
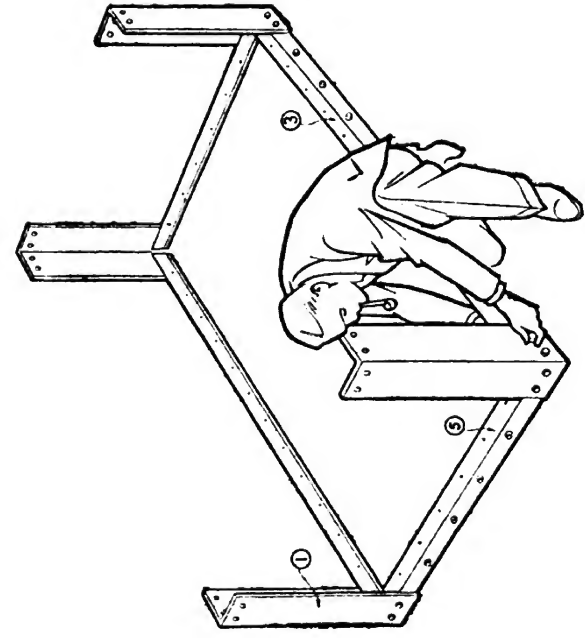


ILLUSTRATION NO. 11. Independent timber framework for a refuge room. If the posts are more than 6 ft. 6 in. apart, 8 in. x 4 in. beams are desirable.

A home-made shelter

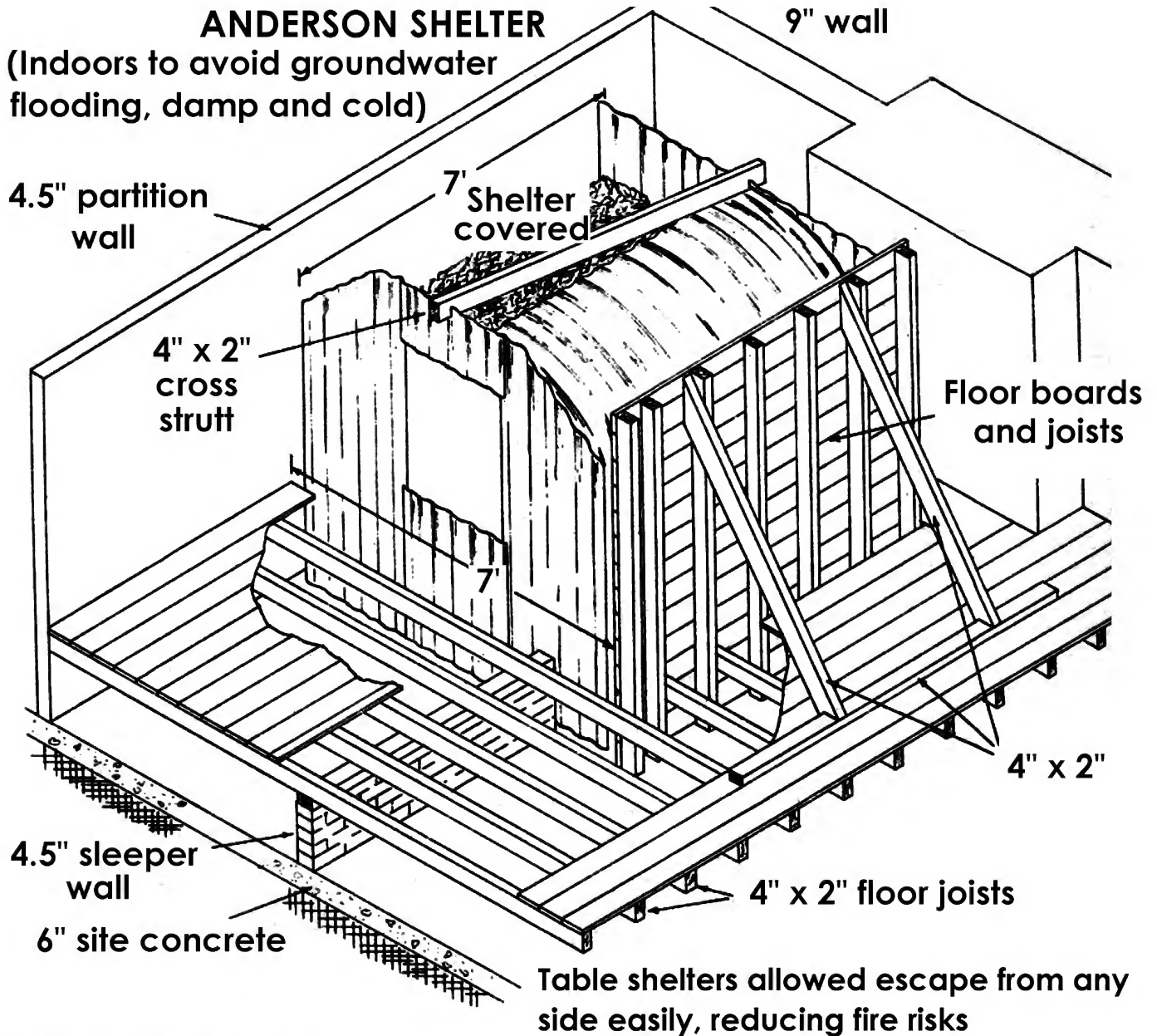
You will have noticed earlier in this booklet the statement that people have often been rescued from demolished houses because they had taken shelter under an ordinary table. This was because the table had by chance been strong enough to bear the weight of the falling bedroom floor. A timber framework can be built inside a refuge room to do the same thing, but with certainty. ILLUSTRATION NO. 11 shows a completed framework

How to Put Up Your "Morrison" Steel Table Shelter, 1942





Structural Defense, 1945, by D. G. Christopherson, Ministry of Home Security, RC 450, (1946); Chapters VIII and IX (Confidential). National Archives
Chapter VIII summarizes the literature on the design and types of British shelters and analyzes their effectiveness. HO 195/16



MORRISON SHELTER
(indoor table shelter)

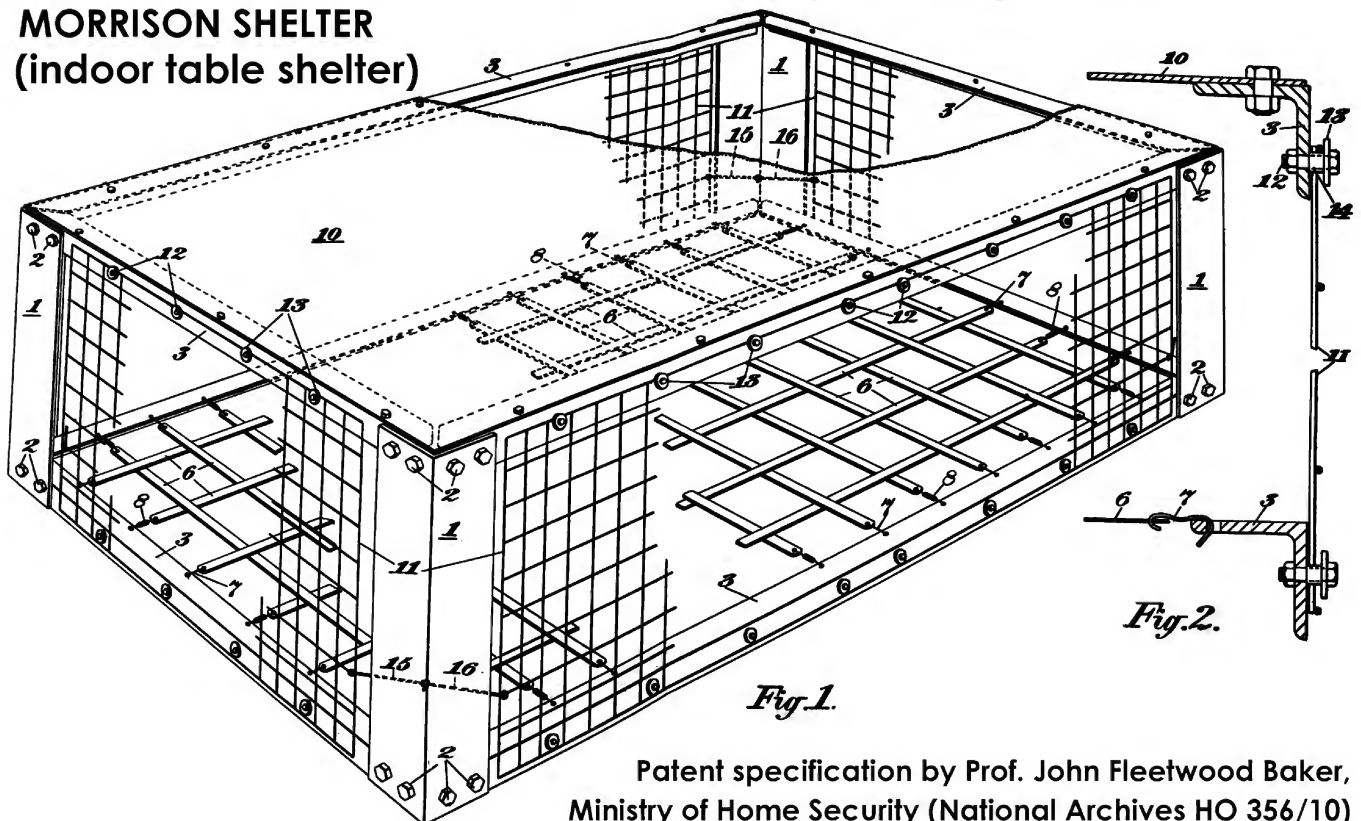




ILLUSTRATION NO. 8.

The house in the upper photograph had a Government steel table shelter in a downstairs room and was blown up to reproduce the effect of a heavy bomb falling near. The whole house collapsed, burying the shelter under débris. In the lower photo the shelter can be seen still intact. It would have been possible for anyone in the shelter to get out unaided.





(THIS DOCUMENT IS THE PROPERTY OF HIS BRITANNIC MAJESTY'S GOVERNMENT).

SECRET.

W.P.(G)(41)7.

COPY NO. 62

January 15th, 1941.

W A R C A B I N E T.

AIR RAID SHELTER POLICY.

Memorandum by the Minister of Home Security.

6. Shelter in the home: The Anderson shelter was originally intended for indoor use but for a number of reasons including the danger of fire an outdoor variant was adopted. Experience has shown that the objections to the indoor use of the Anderson or somewhat similar shelter are not so serious as was thought and two designs have been produced which can be erected indoors without support. These new types, although they may give slightly less protection than a well covered Anderson shelter out of doors, would fill the needs of a large section of the public, especially the middle class. One design allows the use of the shelter as part of the furniture of the room.

7. I regard shelters of this type as of the first importance and wish to provide them on a big scale. Each shelter will use over 3 cwt. of steel and will allow at a pinch two adults and one to two children to sleep inside. For an outlay of about 65,000 tons of steel, as a first instalment, I could therefore produce 400,000 shelters with accommodation for at least 1,000,000 persons. I should wish to complete such a programme within the first three months of production and thereafter at a similar or increasing rate. From enquiries I believe that manufacture can be arranged provided steel is supplied and if the Cabinet approves my policy I shall require their direction that the steel be made available.

10. Conclusions.

I ask for a general endorsement of the policy I have outlined in this paper and in particular for the agreement of my colleagues:

- (i) that proposals for building shelters of massive construction should be rejected;
- (ii) that steel should be made available to carry out the programme outlined in paragraph 7 for the provision of steel shelters indoors;
- (iii) that the limit of income for the provision of free shelter for insured persons should be raised from £250 to £350 per annum.

H.M.

MINISTRY OF HOME SECURITY.

January 15th, 1941.

Morrison Shelters in Recent Air Raids.

National Archives
HO197/24

A report of Ministry of Home Security experts on 39 cases of bombing incidents in different parts of Britain covering all those for which full particulars are available in which Morrison shelters were involved shows how well they have stood up to severe tests of heavy bombing.

All the incidents were serious. Many of the incidents involved direct hits on the houses concerned a risk against which it was never claimed these shelters would afford protection. In all of them the houses in which shelters were placed were within the radius of damage by bombs; in 24 there was complete demolition of the house on the shelter.

A hundred and nineteen people were sheltering in these "Morrison's" and only four were killed. So that 115 out of 119 people were saved. Of these only 7 were seriously injured and 14 slightly injured while 94 escaped uninjured. The majority were able to leave their shelters unaided.



Morrison shelter saves lives of Mr McGregor pictured beside Morrison shelter, as well as his wife and lodger, in collapsed house, York 1942 air raid



Morrison indoor table shelter test by Ministry of Home Security, 1941: result shelter survived and occupants would have escaped unaided. (Source: "Shelter at Home", June 1941 handbook.)



Morrison shelter saves lives of Mr McGregor (pictured beside Morrison shelter), as well as his wife and lodger, in collapsed house, York 1942 air raid

UK National Archives: HO 192/909

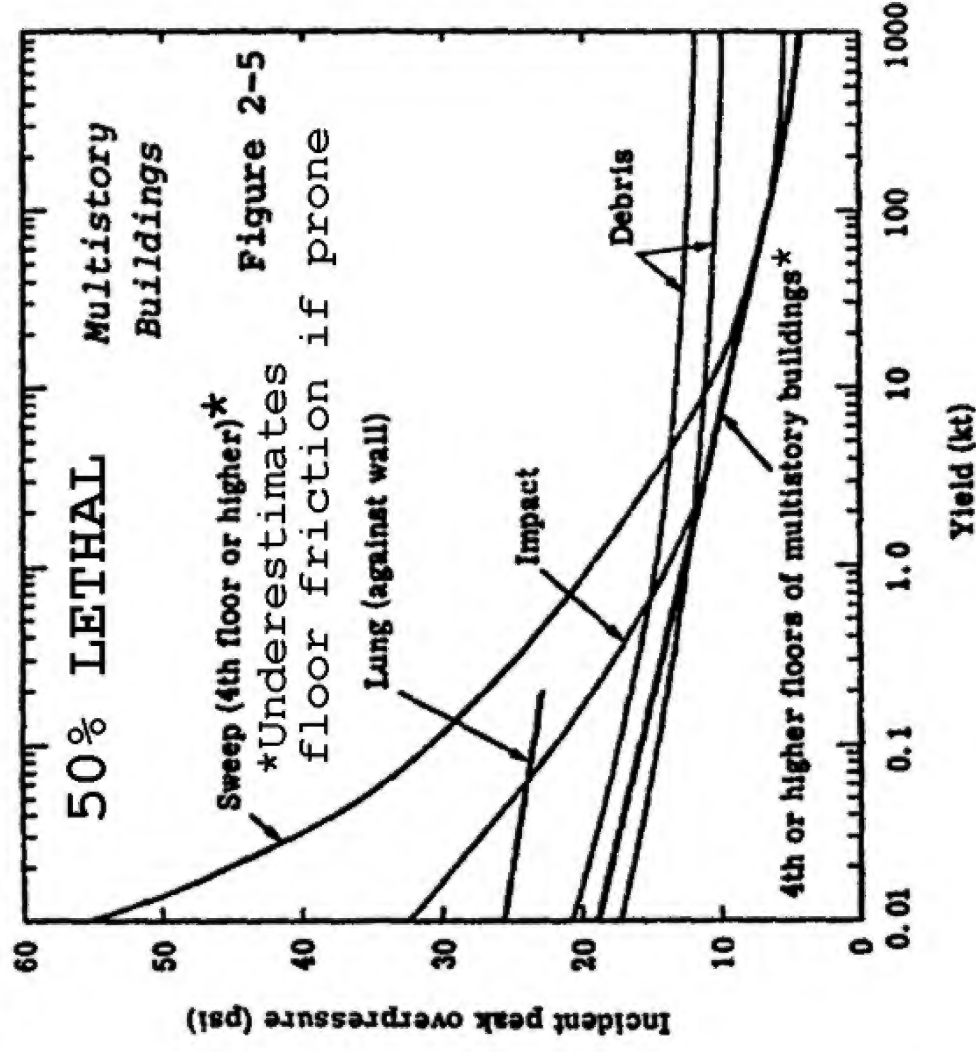
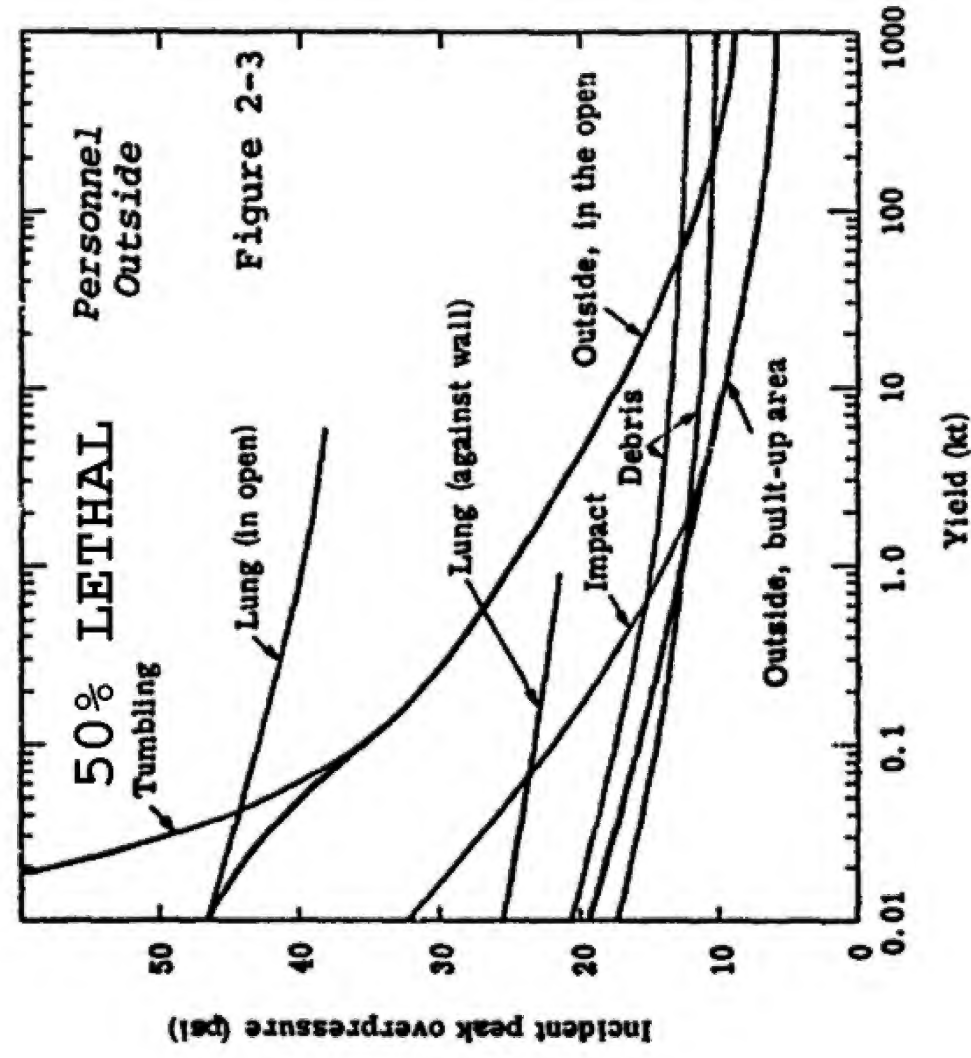
**Morrison shelter surviving 250 kg direct hit on 12 March 1943
on house at 10 Fore Street, Salcombe (Mrs Hannaford)**

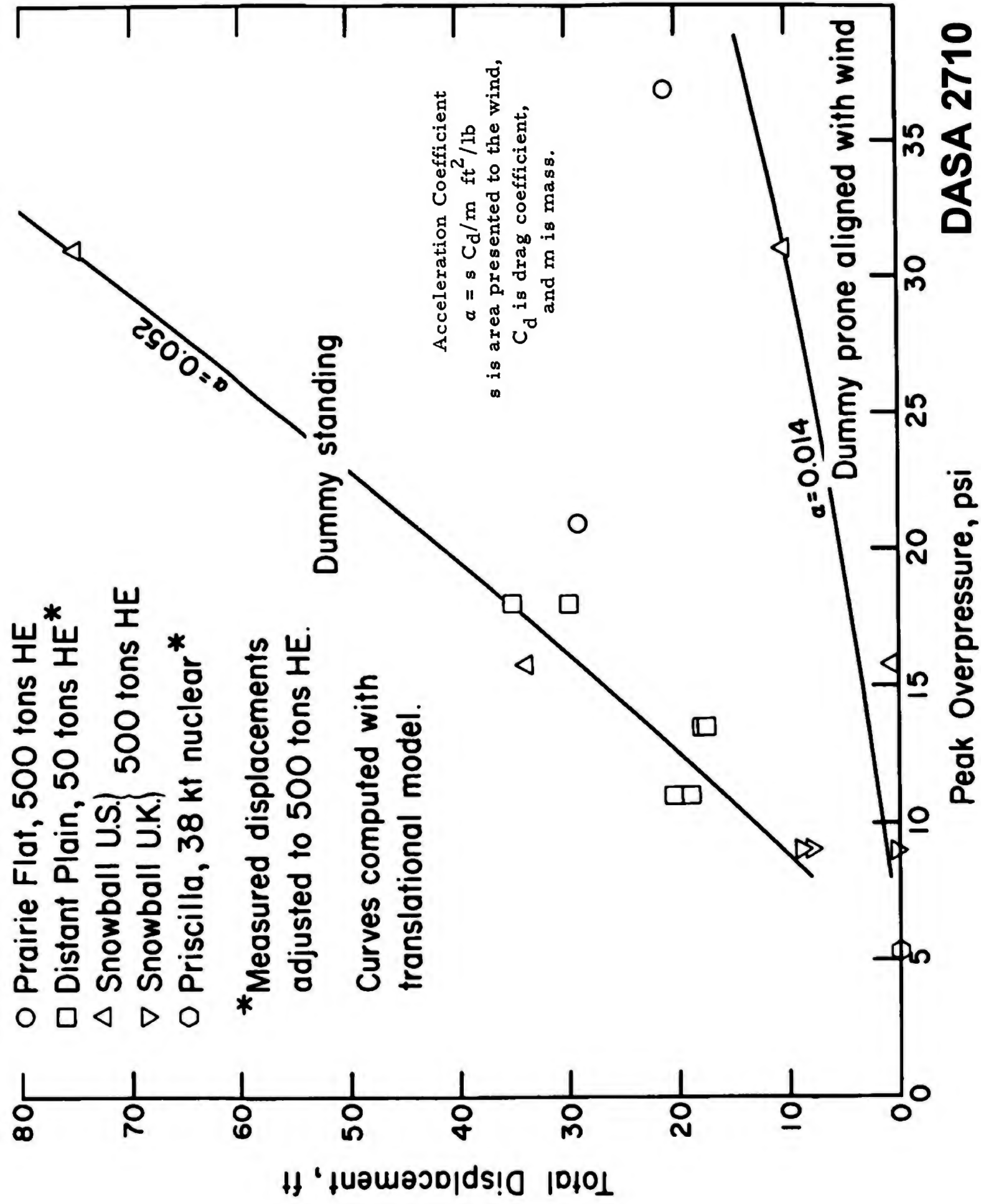




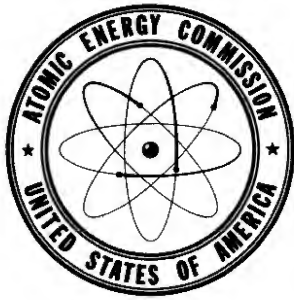
WWII Surface shelter (UK National Archives INF 13/218)

Dr Martin P. Fricke (Science Applications International Corp., California), "Preliminary Civilian Casualty Criteria for Low-Yield Nuclear Weapons," DNA-3547T, 1975.





The Effects of Nuclear Weapons



SAMUEL GLASSTONE
Editor

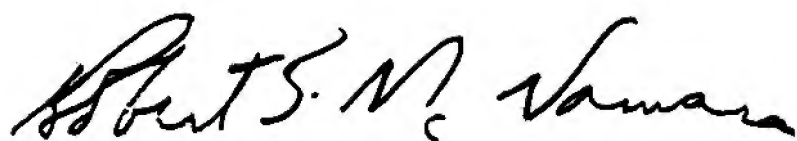
Revised Edition
Reprinted February 1964

Prepared by the
UNITED STATES DEPARTMENT OF DEFENSE
Published by the
UNITED STATES ATOMIC ENERGY COMMISSION
April 1962

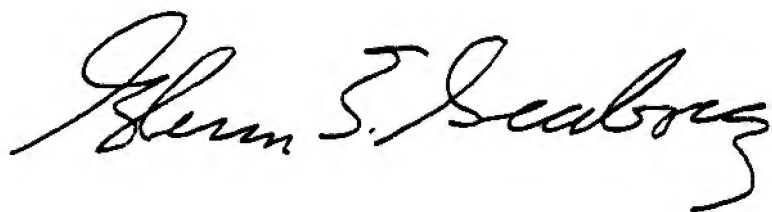
Foreword

This book is a revision of "The Effects of Nuclear Weapons" which was issued in 1957. It was prepared by the Defense Atomic Support Agency of the Department of Defense in coordination with other cognizant governmental agencies and was published by the U.S. Atomic Energy Commission. Although the complex nature of nuclear weapons effects does not always allow exact evaluation, the conclusions reached herein represent the combined judgment of a number of the most competent scientists working on the problem.

There is a need for widespread public understanding of the best information available on the effects of nuclear weapons. The purpose of this book is to present as accurately as possible, within the limits of national security, a comprehensive summary of this information.

A handwritten signature in dark ink, reading "Robert S. McNamara". The signature is fluid and cursive, with the first name "Robert" and last name "McNamara" clearly legible.

Secretary of Defense

A handwritten signature in dark ink, reading "Glenn T. Seaborg". The signature is fluid and cursive, with the first name "Glenn" and last name "Seaborg" clearly legible.

Chairman
Atomic Energy Commission

BASIS FOR PROTECTIVE ACTION

12.11 In Japan, where little evasive action was taken, the survival probability depended upon whether the individual was outdoors or inside a building and, in the latter case, upon the type of structure. At distances between 0.3 and 0.4 mile (530 and 700 yards) from ground zero in Hiroshima the average survival rate, for at least 20 days after the nuclear explosion, was less than 20 percent. Yet in two reinforced-concrete office buildings, at these distances, almost 90 percent of the nearly 800 occupants survived more than 20 days, although some died later from radiation injury.

These facts bring out clearly the greatly improved chances of survival from a nuclear explosion that could result from the adoption of suitable warning and protective measures.

TABLE 12.29—ARRIVAL TIME FOR PEAK OVERPRESSURE

<i>Distance</i> (miles)	<i>Explosion yield</i>				
	<i>1 KT</i>	<i>10 KT</i>	<i>100 KT</i>	<i>1 MT</i>	<i>10 MT</i>
	<i>(Time in seconds)</i>				
1	4.3	3.6	3.7	2.5	1.5
2	9	8.1	7.4	6.5	5.0

12.35. The major part of the thermal radiation travels in straight lines, and so any opaque object interposed between the fireball and the exposed skin will give some protection. This is true even if the object is subsequently destroyed by the blast, since the main thermal radiation pulse is over before the arrival of the blast wave.

12.36 At the first indication of a nuclear explosion, by a sudden increase in the general illumination, a person inside a building should immediately fall prone, as described in § 12.30, and, if possible, crawl behind or beneath a table or desk or to a planned vantage point.

12.72 Because of its particulate nature, fallout will tend to collect on horizontal surfaces, e.g., roofs, streets, tops of vehicles, and the ground. In the preliminary decontamination, therefore, the main effort should be directed toward cleaning such surfaces. The simplest way of achieving this is by water washing, if an adequate supply of water is available. The addition of a commercial wetting agent (detergent) will make the washing more efficient. The radioactive material is thus transferred to storm sewers where it is less of a hazard.

Nevada in 1953.

12 calories per square centimeter

ignitable
trash



before exposure to a nuclear explosion



after exposure to a nuclear explosion

7.59 The value of fire-resistive furnishing in decreasing the number of ignition points was also demonstrated in the tests. Two identical, sturdily constructed houses, each having a window 4 feet by 6 feet facing the point of burst, were erected where the thermal radiation exposure was 17 calories per square centimeter. One of the houses contained rayon drapery, cotton rugs, and clothing, and, as was expected, it burst into flame immediately after the explosion and burned completely. In the other house, the draperies were of vinyl plastic, and rugs and clothing were made of wool. Although much ignition occurred, the recovery party, entering an hour after the explosion, was able to extinguish the fires.

7.76 It should be noted that the fire storm is by no means a special characteristic of nuclear weapons. Similar fire storms have been reported as accompanying large forest fires in the United States, and especially after incendiary bomb attacks in both Germany and Japan during World War II. The high winds are produced largely by the updraft of the heated air over an extensive burning area. They are thus the equivalent, on a very large scale, of the draft of a chimney under which a fire is burning. Because of limited experience, the conditions for the development of fire storms in cities are not well known. It appears, however, that some, although not necessarily all, of the essential requirements are the following: (1) thousands of nearly simultaneous ignitions over an area of at least a square mile, (2) heavy building density, e.g., more than 20 percent of the area is covered by buildings, and (3) little or no ground wind. Based on these criteria, only certain sections—usually the older and slum areas—of a very few cities in the United States would be susceptible to fire storm development.

Weapon test report WT-775, Project 8.11b, ENCORE nuclear test, Nevada, 1953:

**Decayed
fence**

**White
washed**

**Decayed +
trashed**



No trash kindling

Trash kindling for fire

Effect of 12 calories/sq cm thermal flash:



**BURNED AFTER
15 MINUTES**

**NO
FIRE**

**IMMEDIATE
IGNITION**

6' x 6' wood frame houses

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ARMED FORCES
SPECIAL WEAPONS PROJECT

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HANDBOOK on CAPABILITIES of NUCLEAR WEAPONS

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10.3 Damage Criteria

10.32 For those items not included in Table VIII, select the listed item most similar in those characteristics discussed previously as being the important factors in determining the extent of damage to be expected. Perhaps the most important item to be remembered when estimating effects on personnel is the amount of cover actually involved. This cover depends on several items; however, one factor is all important, namely, the degree of forewarning of an impending atomic attack. It is obvious that only a few seconds warning is necessary under most conditions in order to take fairly effective cover. The large number of casualties in Japan resulted for the most part from the lack of warning.

TABLE VIII			
ITEM	DAMAGE	AIR SHOCK PSI	REMARKS
Artillery Field (75mm or greater)	Severe	40	Damage to Gun and Cradle
	Moderate	30	Damage to Recoil and Carriage
	Light	5	Damage to Gun Sights
Artillery Field (Less than 75mm)	Severe	25	Damage to Gun and Cradle
	Moderate	15	Damage to Recoil and Loading Mechanism
	Light	5	Damage to Sights
Reinforced Concrete Bldgs.	Severe	25	Collapse
	Moderate	10	Structural damage
	Light	3	Plaster & window damage
Steel, heavy frame Bldgs.	Severe	18	Mass distortion
	Moderate	12	Structural Damage
	Light	3	Plaster & window damage
Steel, light frame Bldgs.	Severe	10	Mass distortion
	Moderate	5	Structural Damage
	Light	3	Plaster & window damage

FM 101-31-3

DEPARTMENT OF THE ARMY FIELD MANUAL

STAFF OFFICERS FIELD MANUAL

NUCLEAR WEAPONS EMPLOYMENT



HEADQUARTERS, DEPARTMENT OF THE ARMY
FEBRUARY 1963

ATOMIC DEMOLITION MUNITIONS

on the surface

SEVERE DAMAGE RADII—METERS

<i>Materiel classification</i>	<i>Yield—KT</i>					
	<i>ALFA/ .5</i>	<i>BRAVO/ 1</i>	<i>DELTA/ 5</i>	<i>ECHO/ 10</i>	<i>GOLF/ 50</i>	<i>HOTEL/ 100</i>
Tunnels and mines Heavy masonry or concrete dams and bridges	50	50	125	175	225	300
Tanks and artillery Locomotives Supply depots Engineer earthmoving equip Field fortifications	75	100	175	250	450	600
Engineer truck-mounted equip Earth-covered surface shelters Blast-resistant reinforced concrete bldgs	100	100	200	250	400	525
Military vehicles Railroad cars Communications equip Truss and floating bridges Monumental-type multistory wall-bearing bldgs Heavy steel frame industrial bldgs Multistory, reinforced concrete frame bldgs	150	200	375	500	950	1,250
Oil storage tanks Multistory, reinforced concrete bldgs (small window area) Multistory, steel frame office bldgs Light steel frame industrial bldgs	250	300	475	650	1,125	1,425
Multistory, wall-bearing bldgs (apt house type) Parked combat aircraft	375	450	800	1,000	1,700	2,125
Wood frame bldgs	375	650	1,050	1,325	2,275	2,875

Figure 12.1.

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DEPARTMENT OF THE ARMY TECHNICAL MANUAL

DEPARTMENT OF THE NAVY

DEPARTMENT OF THE AIR FORCE

MARINE CORPS PUBLICATIONS

TM 23-200

OPNAV INSTRUCTION 03400.1B

AFL 136-1

NAVMC 1104 REV

CAPABILITIES OF ATOMIC WEAPONS (U)



Prepared by
Armed Forces Special Weapons Project

**DEPARTMENTS OF THE ARMY, THE NAVY
AND THE AIR FORCE**

REVISED EDITION NOVEMBER 1957

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

Personnel in structures. A major cause of personnel casualties in cities is structural collapse and damage. The number of casualties in a given situation may be reasonably estimated if the structural damage is known. Table 6-1 shows estimates of casualty production in two types of buildings for several damage levels. Data from Section VII may be used to predict the ranges at which specified structural damage occurs. Demolition of a brick house is expected to result in approximately 25 percent mortality, with 20 percent serious injury and 10 percent light injury. On the order of 60 percent of the survivors must be extricated by rescue squads. Without rescue they may become fire or asphyxiation casualties, or in some cases be subjected to lethal doses of residual radiation. Reinforced concrete structures, though much more resistant to blast forces, produce almost 100 percent mortality on collapse. The figures of table 6-1 for brick homes are based on data from British World War II experience. It may be assumed that these predictions are reasonably reliable for those cases where the population is in a general state of expectancy of being subjected to bombing and that most personnel have selected the safest places in the buildings as a result of specific air raid warnings. For cases of no prewarning or preparation, the number of casualties is expected to be considerably higher.

6-2

Glass breakage extends to considerably greater ranges than almost any other structural damage, and may be expected to produce large numbers of casualties at ranges where personnel are relatively safe from other effects, particularly for an unwarned population.

Table 6-1. *Estimated Casualty Production in Structures for Various Degrees of Structural Damage*

	Killed outright	Serious injury (hospitalization)	Light injury (No hospitalization)
1-2 story brick homes (high explosive data):	Percent	Percent	Percent
Severe damage.....	25	20	10
Moderate damage.....	<5	10	5
Light damage.....	.....	<5	<5

Note. These percentages do not include the casualties which may result from fires, asphyxiation, and other causes from failure to extricate trapped personnel. The numbers represent the estimated percentage of casualties expected at the maximum range where the specified structural damage occurs.

Personnel in a prone position are less likely to be struck by flying missiles than those who remain standing.

6-3

Table 6-2. *Critical Radiant Exposures for Burns Under Clothing*

(Expressed in cal/cm² incident on outer surface of cloth)

Clothing	Burn	1 KT	100 KT	10 MT
Summer Uniform.....	1°	8	11	14
(2 layers).....	2°	20	25	35
Winter Uniform.....	1°	60	80	100
(4 layers).....	2°	70	90	120

6-4

CONFIDENTIAL

3.1 General

For a surface burst having the same yield as an air burst, the presence of the earth's surface results in a reduced thermal radiation emission and a cooler fireball when viewed from that surface. This is due primarily to heat transfer to the soil or water, the distortion of the fireball by the reflected shock wave, and the partial obscuration of the fireball by dirt and dust (or water) thrown up by the blast wave.

~~CONFIDENTIAL~~

3-1

Measurements from the ground of the total thermal energy from surface bursts, although not as extensive as those for air bursts, indicate that the thermal yield is a little less than half that from equivalent air bursts. For a surface burst the thermal yield is assumed to be one-seventh of the total yield.

3-2

~~CONFIDENTIAL~~

3.3 Radiant Exposure vs. Slant Range

a. *Spectral Characteristics.* At distances of operational interest, the spectral (wavelength) distribution of the incident thermal radiation, integrated with respect to time, resembles very closely the spectral distribution of sunlight. For each, slightly less than one-half of the radiation occurs in the visible region of the spectrum, approximately one-half occurs in the infrared region and a very small fraction (rarely greater than 10 percent) lies in the ultraviolet region of the spectrum. The color temperature of the sun and an air burst are both about 6,000° K. A surface burst, as viewed by a ground observer, contains a higher proportion of infrared radiation and a smaller proportion of visible radiation than the air burst, with almost no radiation in the ultraviolet region. The color temperature for a surface burst is about 3,000° K. A surface burst viewed from the air may exhibit a spectrum more nearly like an air burst.

$$Q = \frac{3.16 \times 10^6 W (\bar{T})}{D^2} \text{ cal/sq cm (air burst).}$$

and

$$Q = \frac{1.35 \times 10^6 W (\bar{T})}{D^2} \text{ cal/sq cm (surface burst).}$$

where Q =radiant exposure (cal/sq cm)
 \bar{T} =atmospheric transmissivity
 W =weapon yield (KT)
 D =slant range (yds).

~~CONFIDENTIAL~~

3-3

The differences between the air burst and surface burst curves are caused by the difference in apparent radiating temperatures (when viewed from the ground) and the difference in geometrical configuration of the two types of burst.

50 mile visibility and 5 gm/m³ water vapor.
10 mile visibility and 10 gm/m³ water vapor.

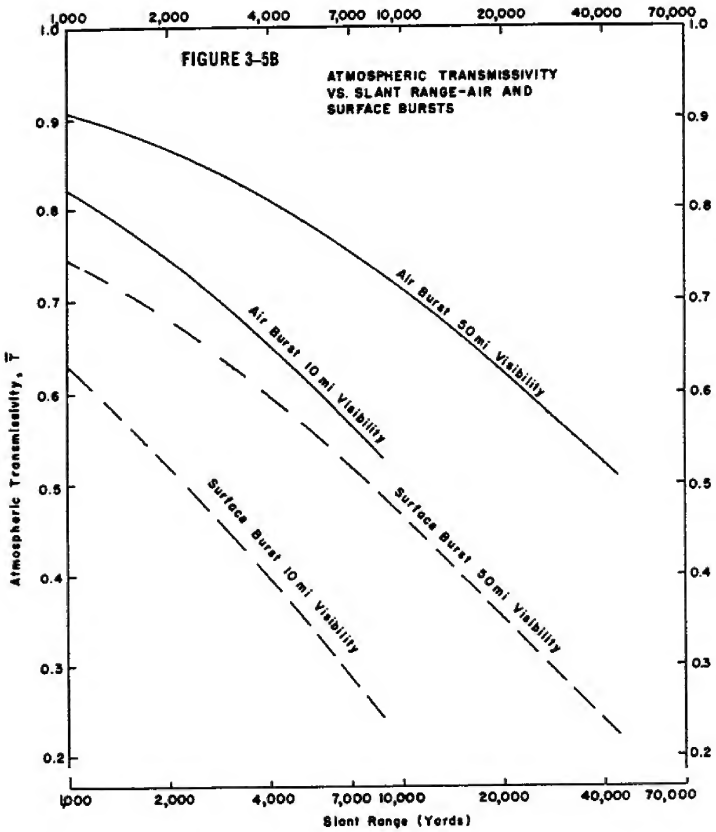


Table 12-2. Critical Radiant Exposure Values for Various Materials

Material	Damage	Critical radiant exposure Q _c , (cal/sq cm)		
		1 KT	100 KT	10 MT
Sandbags: Cotton canvas, dry, filled.....	Failure.....	10	18	32
Wood, white pine.....	0.1 mm depth char.....	10	18	32
White pine, given protective coating.....	0.1 mm depth char.....	40	71	126

SECTION VII

DAMAGE TO STRUCTURES

7.1 General

Tunnels in solid rock are difficult to destroy by explosions of nuclear weapons. In this case, the shock wave is transmitted through the rock. When it reaches the tunnel the wave is reflected as a tensile wave, and there is a tendency for the rock to spall or become detached from the rock-tunnel interface. Use of tunnel linings materially reduces this spalling. Mass crushing of the rock and filling of the tunnel occurs closer to the burst point.

7.4 Field Fortifications

a. *Air Blast.* Air blast is the controlling damage-producing mechanism for destruction of field fortifications, including those reinforced, revetted or covered. Definitions of severe, moderate, and light damage levels to various types of field fortifications are given in table 7-4. These damage levels are based upon various degrees of collapse and structural failure except for unrevetted trenches and foxholes, which have damage levels based on degree of filling caused by collapse of the walls and by filling with dust and debris. Areas covered with loose material, such as sand and gravel, may provide sufficient dust and debris to completely fill a trench or foxhole, whereas areas with stable vegetation or areas of dry silty soil may not provide significant quantities of dust and debris to appreciably fill a trench

or foxhole. Collapse of the walls of foxholes and trenches by air blast and air induced ground shock is usually not significant except at ranges less than those shown for severe damage in figure 7-22.

Table 7-4. Damage Criteria for Field Fortifications

Description	Severe
Unrevetted trenches and foxholes with or without light cover.	The trench or foxhole is at least 50 percent filled with earth.

FIGURES 7-20—7-22

The curves in figure 7-22 are based on results of tests run in a *consolidated dry sand and gravel soil*. Trenches and foxholes in damp soil with stable vegetation or dry silty soil will receive moderate and severe damage at ranges less than those shown in figure 7-22. The curves of figure 7-22 are for average rectangular foxholes with the longitudinal axis perpendicular to the direction of air blast propagation. Damage will be equal or less for other orientations.

Given: A 50 KT burst at an altitude of 1,000 feet.

Find: To what horizontal distance there is a 50 percent probability of severe damage to an unrevetted foxhole in a dry, consolidated sand and gravel soil.

Solution: 680 yards.

Approximately 20 psi peak overpressure

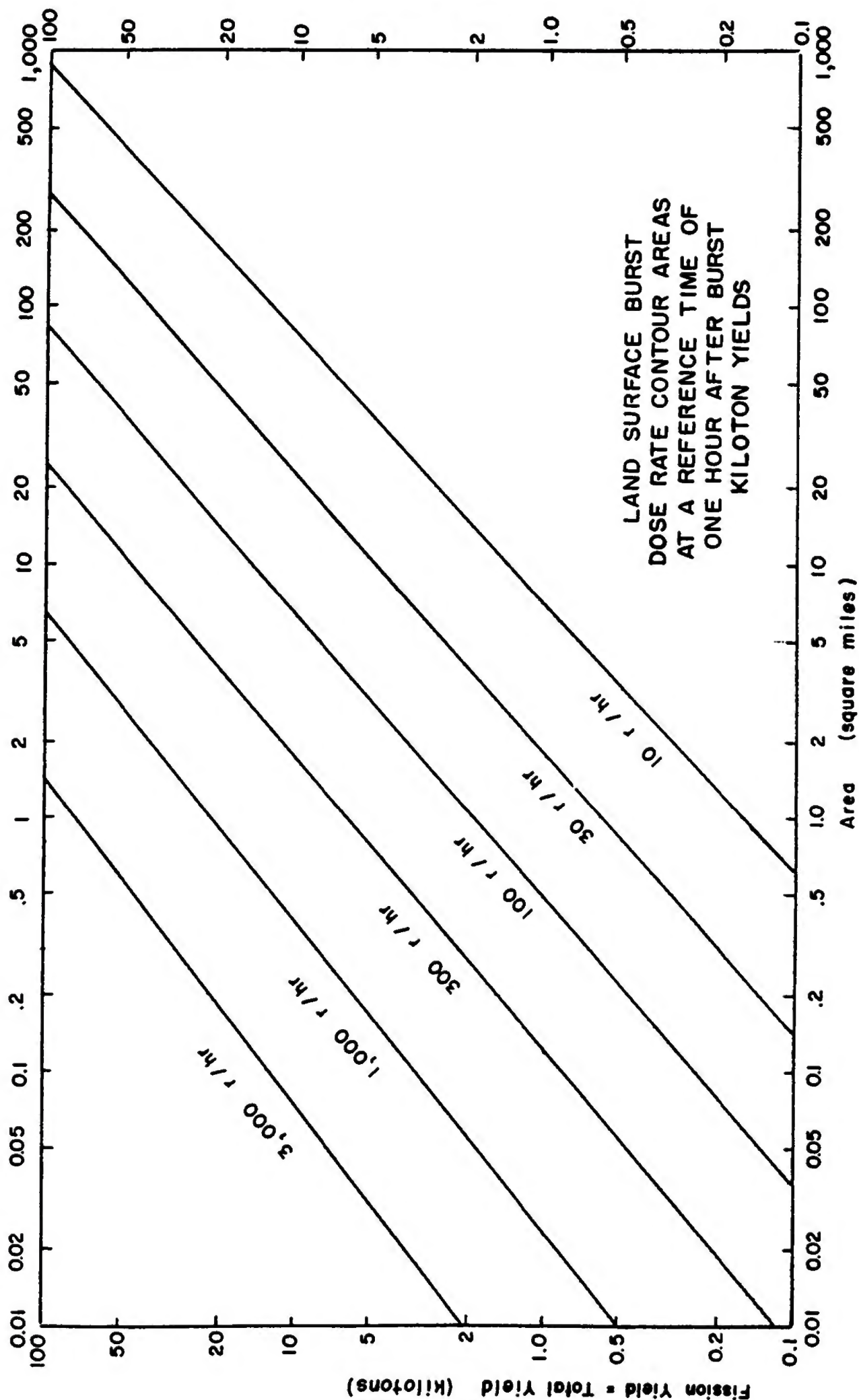
Table 7-3. Damage Criteria for Underground Structures

Structure	Damage	Damage distance	Remarks
Relatively small, heavy, well designed underground targets.	{ Severe..... Light.....	$1\frac{1}{2}R_a$ $2R_a$	Collapse. Slight cracking, severance of brittle external connections.
Relatively long, flexible targets, such as buried pipelines, tanks, etc.	{ Severe..... Moderate.... Light.....	$1\frac{1}{2}R_a$ $2R_a$ $2\frac{1}{2}$ to $3R_a$	Deformation and rupture. Slight deformation and rupture. Failure of connections. (Use higher value for radial orientation of connections.)

Note. R_a = Apparent Crater Radius.

FIGURE 4-14A

~~CONFIDENTIAL~~



~~CONFIDENTIAL~~

**DNA EM-1
PART I**

DEFENSE NUCLEAR AGENCY EFFECTS MANUAL NUMBER 1

CAPABILITIES OF NUCLEAR WEAPONS

1 JULY 1972

**HEADQUARTERS
Defense Nuclear Agency
Washington, D.C. 20305**



FOREWORD

This edition of the *Capabilities of Nuclear Weapons* represents the continuing efforts by the Defense Nuclear Agency to correlate and make available nuclear weapons effects information obtained from nuclear weapons testing, small-scale experiments, laboratory effort and theoretical analysis. This document presents the phenomena and effects of a nuclear detonation and relates weapons effects manifestations in terms of damage to targets of military interest. It provides the source material and references needed for the preparation of operational and employment manuals by the Military Services.

The *Capabilities of Nuclear Weapons* is not intended to be used as an employment or design manual by itself, since more complete descriptions of phenomenological details should be obtained from the noted references. Every effort has been made to include the most current reliable data available on 31 December 1971 in order to assist the Armed Forces in meeting their particular requirements for operational and target analysis purposes.

Comments concerning this manual are invited and should be addressed:

Director
Defense Nuclear Agency
ATTN: STAP
Washington, D. C. 20305



C. H. DUNN
Lt General, USA
Director

**Table 10-1 Estimated Casualty Production in Buildings
for Three Degrees of Structural Damage**

Structural Damage	Percent of Personnel*		
	Killed Outright	Serious Injury (hospitalization)	Light Injury (no hospitalization)
1-2 story brick homes (high-explosive data from England):			
Severe damage	25	20	10
Moderate damage	<5	10	5
Light damage	—	<5	<5
Reinforced-concrete buildings (nuclear data from Japan):			
Severe damage	100	—	—
Moderate damage	10	15	20
Light damage	<5	<5	15

*These percentages do not include the casualties that may result from fires, asphyxiation, and other causes from failure to extricate trapped personnel. The numbers represent the estimated percentages of casualties expected at the maximum range where a specified structural damage occurs. See Chapter 11 for the distances at which these degrees of damage occur for various yields.

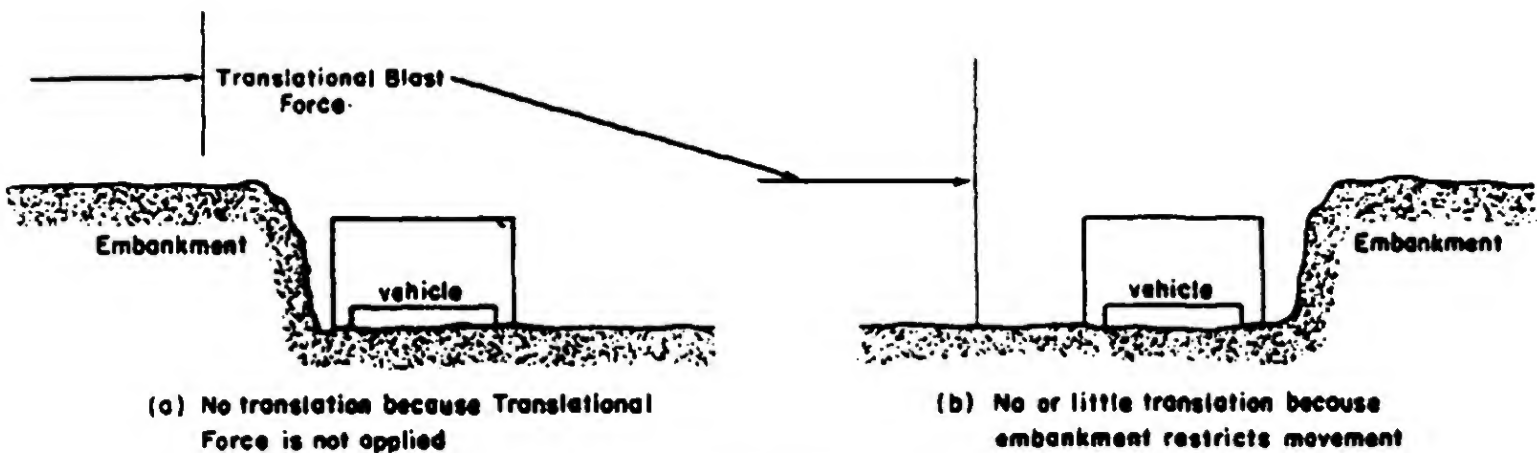


Figure 14-8. The Effect of Shielding

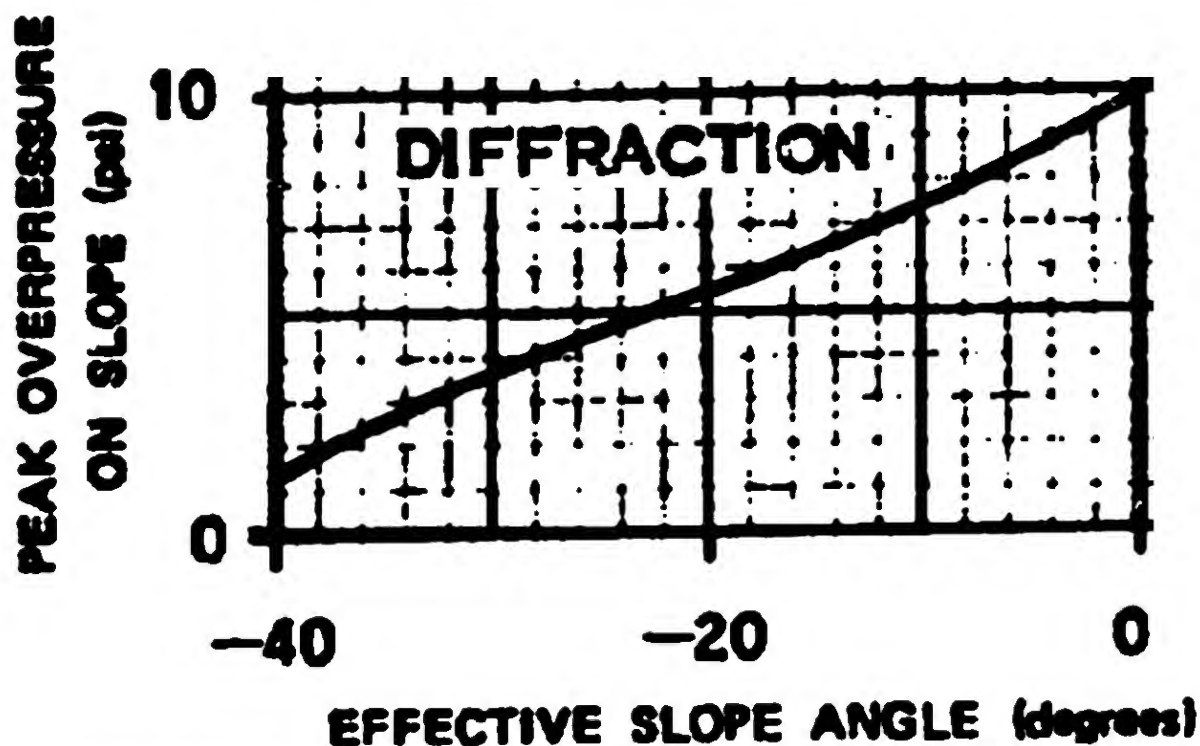


Figure 2-53. Peak Overpressure Produced on a Slope by a 10-psi Incident Mach Stem as a Function of a Slope Angle

If the pulse is of long duration, the ignition threshold rises because the exposed material can dissipate an appreciable fraction of the energy while it is being received. For very long rectangular pulses an irradiance of about $0.5 \text{ cal} \cdot \text{cm}^{-2} \cdot \text{sec}^{-1}$ is required to ignite the cellulose. Heat supplied to the material at a slow rate is just sufficient to offset radiative and convective heat losses, while maintaining the cellulose at the ignition temperature of about 300°C .

9-19

Most thick, dense materials that ordinarily are considered inflammable do not ignite to persistent flaming ignition when exposed to transient thermal radiation pulses. Wood, in the form of siding or beams, may flame during the exposure but the flame is extinguished when the exposure ceases.

9-25

RADIOACTIVE FALL-OUT HAZARDS FROM SURFACE BURSTS OF
VERY HIGH YIELD NUCLEAR WEAPONS

by

D. C. Borg
 L. D. Gates
 T. A. Gibson, Jr.
 R. W. Paine, Jr.

MAY 1954

HEADQUARTERS, ARMED FORCES SPECIAL WEAPONS PROJECT
 WASHINGTON 13, D. C.

e. Passive defense measures, intelligently applied, can drastically reduce the lethally hazardous areas. A course of action involving the seeking of optimum shelter, followed by evacuation of the contaminated area after a week or ten days, appears to offer the best chance of survival. At the distant downwind areas, as much as 5 to 10 hours after detonation time may be available to take shelter before fall-out commences.

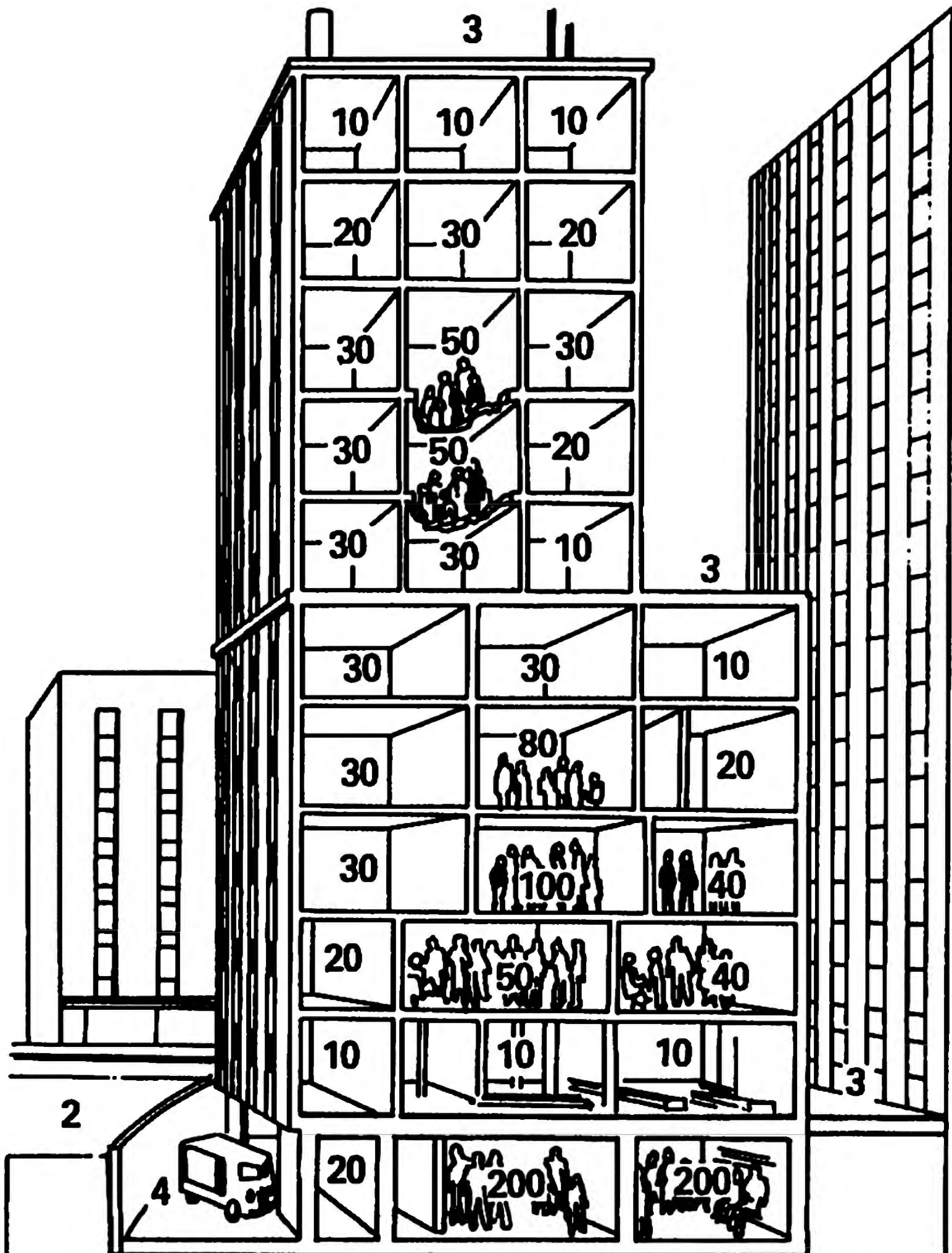
f. Universal use of a simply constructed deep underground shelter, a subway tunnel, or the sub-basement of a large building could eliminate the lethal hazard due to external radiation from fall-out completely, if followed by evacuation from the area when ambient radiation intensities have decayed to levels which will permit this to be done safely.

vii

Table II

Total Isodose Contour: 500r from Fall-out to H+50 Hours

Yield (MT)	15	1	10	60
Downwind extent (mi)	180	52	152	340
Area (mi ²)	5400	470	3880	17,900



Radiation protection factors in modern city buildings
DCPA Attack Environment Manual, ch. 6, panel 18

Analysis of Sheltering and Evacuation Strategies for an Urban Nuclear Detonation Scenario

Larry D. Brandt, Ann S. Yoshimura

Executive Summary

A nuclear detonation in an urban area can result in large downwind areas contaminated with radioactive fallout deposition. Early efforts by local responders must define the nature and extent of these areas, and advise the affected population on strategies that will minimize their exposure to radiation. These strategies will involve some combination of sheltering and evacuation actions. Options for shelter-evacuate plans have been analyzed for a 10 kt scenario in Los Angeles.

Results from the analyses documented in this report point to the following conclusions:

- When high quality shelter (protection factor ~ 10 or greater) is available, shelter-in-place for at least 24 hours is generally preferred over evacuation.
- Early shelter-in-place followed by informed evacuation (where the best evacuation route is employed) can dramatically reduce harmful radiation exposure in cases where high quality shelter is not immediately available.
- Evacuation is of life-saving benefit primarily in those hazardous fallout regions where shelter quality is low and external fallout dose rates are high. These conditions may apply to only small regions within the affected urban region.
- External transit from a low quality shelter to a much higher quality shelter can significantly reduce radiation dose received if the move is done soon after the detonation and if the transit times are short.

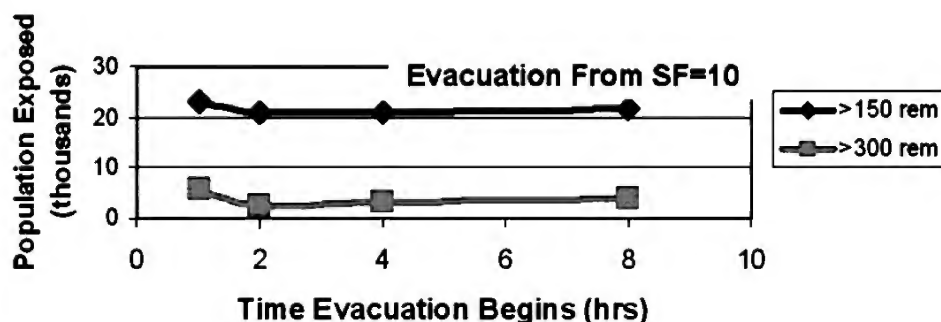
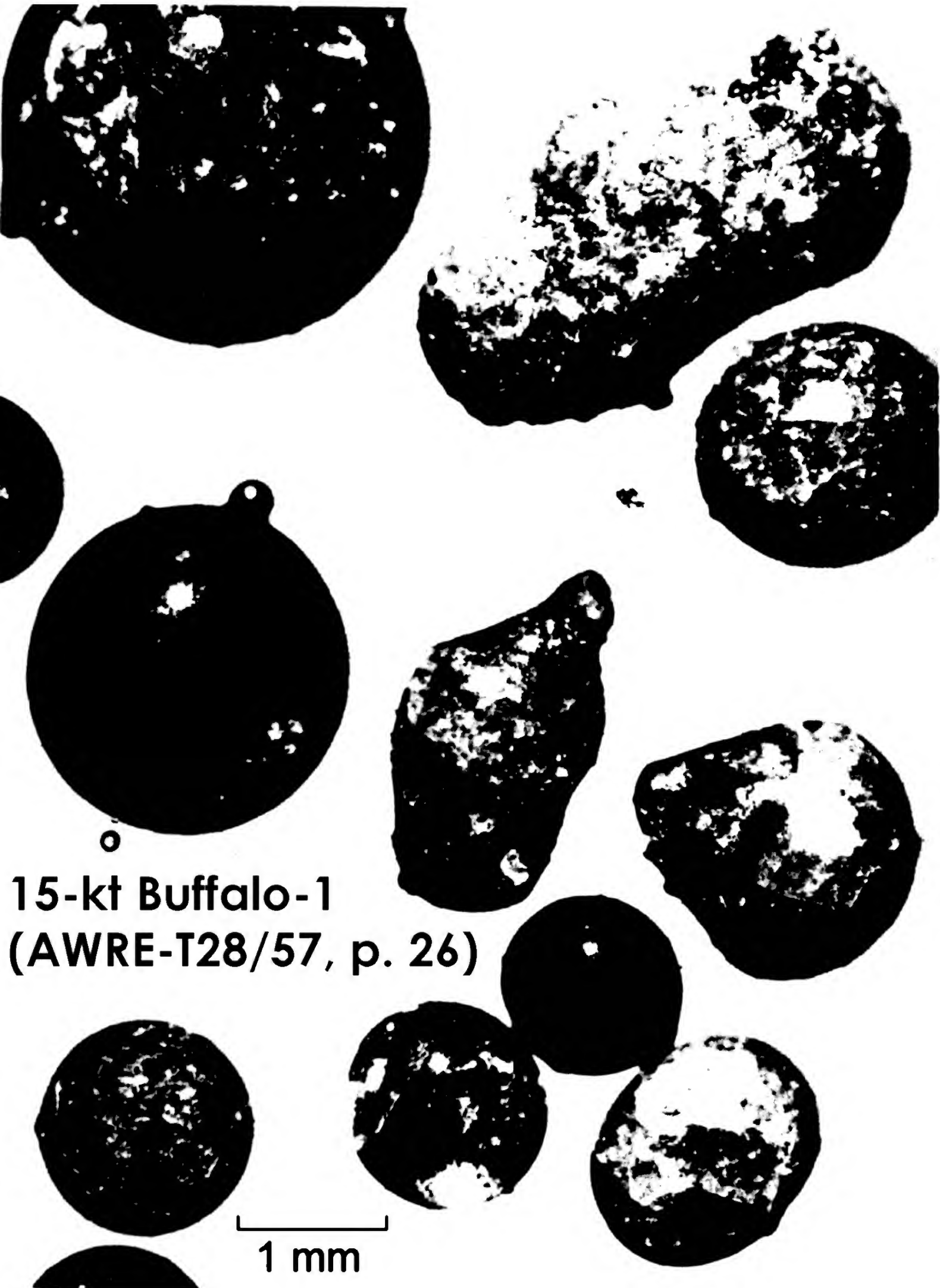


Figure 12. Departure time sensitivities for informed evacuations from shelters with SF=4



o

**15-kt Buffalo-1
(AWRE-T28/57, p. 26)**

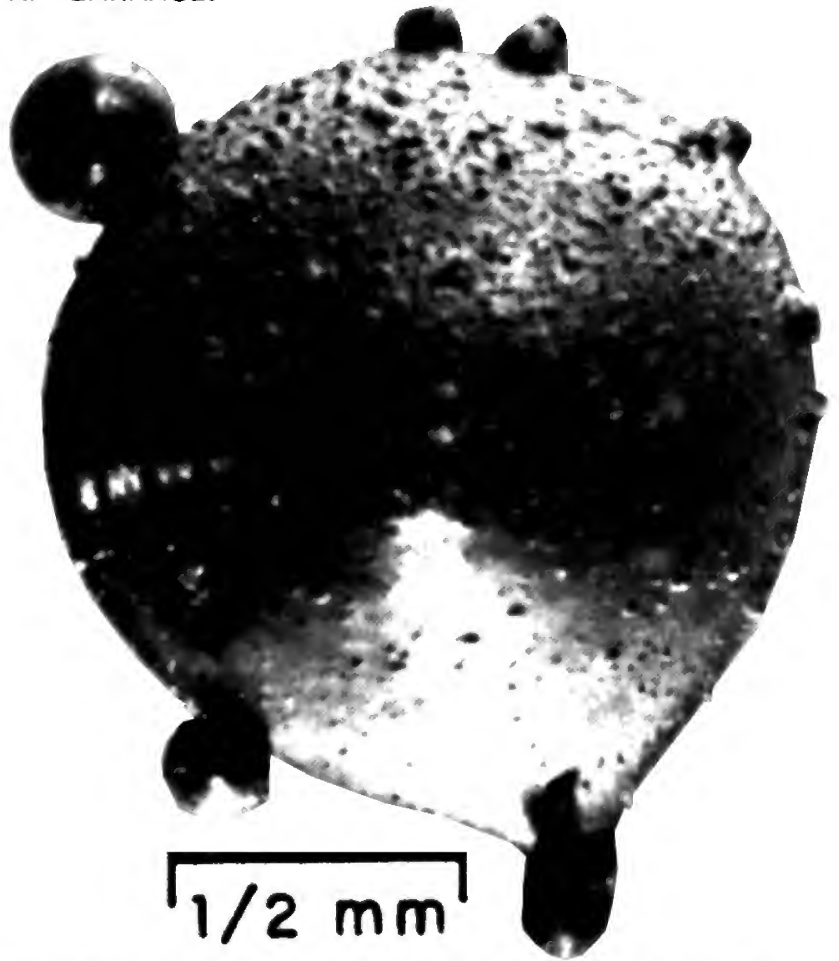
1 mm

TWO FALLOUT PARTICLES FROM A TOWER SHOT AT THE NEVADA TEST SITE. THE PARTICLE ON THE LEFT IS A PERFECT SPHERE WITH A HIGHLY GLOSSY SURFACE; THE ONE ON THE RIGHT HAS MANY PARTIALLY-ASSIMILATED SMALLER SPHERES ATTACHED TO ITS SURFACE. BOTH PARTICLES ARE BLACK AND MAGNETIC AND HAVE A SUPERFICIAL METALLIC APPEARANCE.



1/2 mm

Shiny black marble
(iron oxide in glass)



1/2 mm

THIN SECTION AND RADIOGRAPH OF A FALLOUT PARTICLE FROM A MODERATE-YIELD TOWER SHOT AT THE NEVADA TEST SITE. THIS PARTICLE IS COMPOSED OF A TRANSPARENT GLASS CORE WITH A DARKLY COLORED IRON OXIDE GLASS OUTER ZONE. MOST OF THE RADIOACTIVITY IS CONCENTRATED IN THE OUTER ZONE

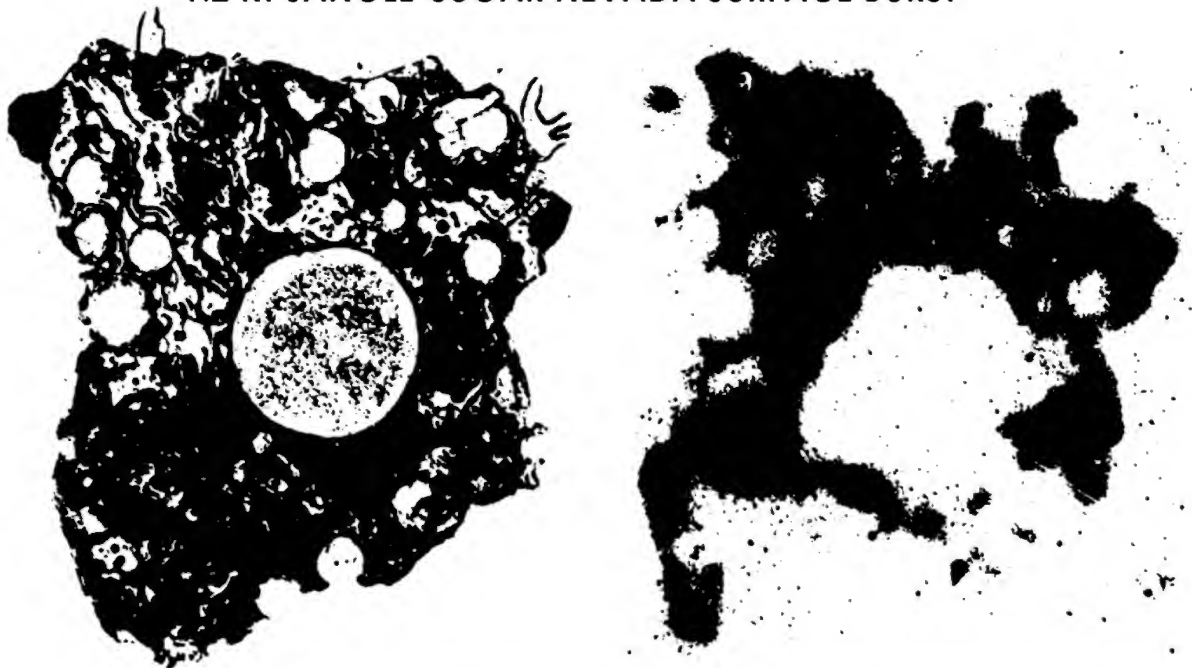


1 mm

C.E. Adams. The Nature of Individual Radioactive Particles. IV. Fallout Particles From A.B.D. of Operation UPSHOT-KNOTHOLE. U.S. Naval Radiological Defense Laboratory Report, USNRDL-440, February 24, 1954

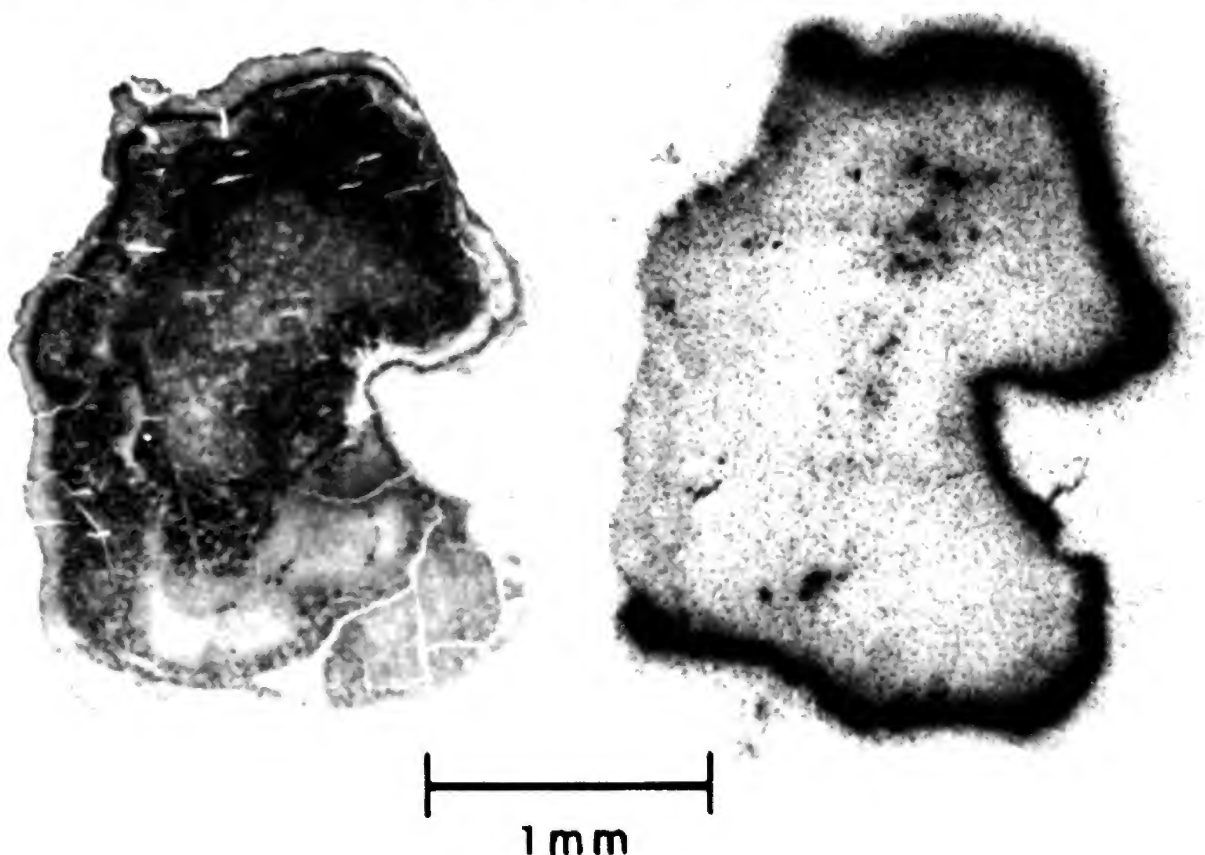
THIN SECTION AND RADIOGRAPH OF A FALLOUT PARTICLE FROM A SMALL-YIELD SURFACE SHOT AT THE NEVADA TEST SITE. THE PARTICLE IS A TRANSPARENT YELLOW-BROWN GLASS WITH MANY INCLUSIONS OF GAS BUBBLES AND UNMELTED MINERAL GRAINS. THE RADIOACTIVITY IS DISTRIBUTED IRREGULARLY THROUGHOUT THE GLASS PHASE OF THE PARTICLE

1.2 KT JANGLE-SUGAR NEVADA SURFACE BURST

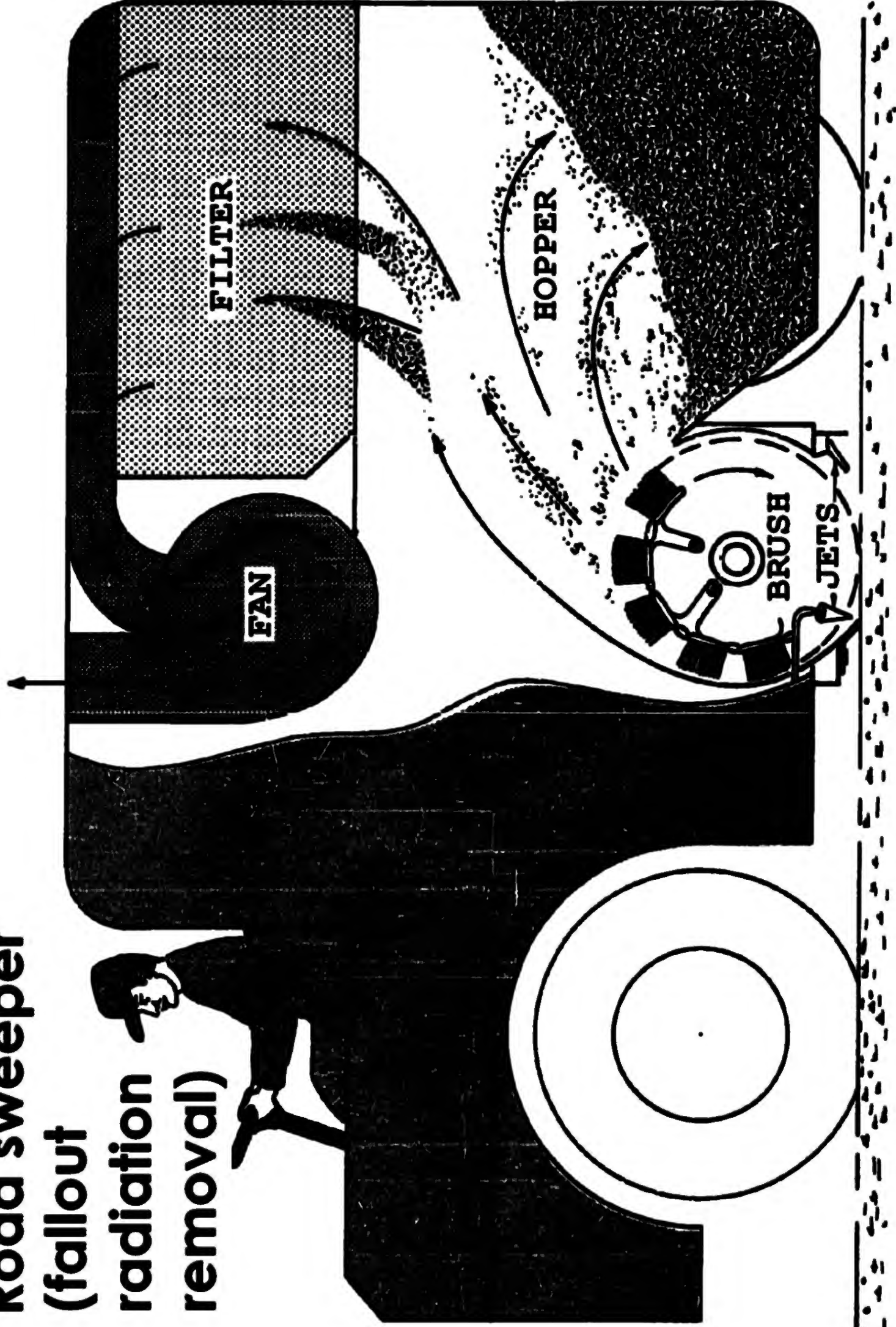


C.E. Adams, et al. The Nature of Individual Radioactive Particles. I. Surface and Underground A.B.D. Particles From Operation JANGLE. U.S. Naval Radiological Defense Laboratory Report, USNRDL-374, November 28, 1952

THIN SECTION AND RADIOGRAPH OF AN ANGULAR FALLOUT PARTICLE FROM A LARGE-YIELD SURFACE SHOT AT THE ENIWETOK PROVING GROUNDS. THIS PARTICLE IS COMPOSED ALMOST ENTIRELY OF CALCIUM HYDROXIDE WITH A THIN OUTER LAYER OF CALCIUM CARBONATE. THE RADIOACTIVITY HAS COLLECTED ON THE SURFACE AND HAS DIFFUSED A SHORT DISTANCE INTO THE PARTICLE



Road sweeper (fallout radiation removal)



29 July 1986

AD 641480

REMOVAL OF SIMULATED FALLOUT FROM ASPHALT
STREETS BY FIREHOSING TECHNIQUES

by

L.L. Wiltshire

W.L. Owen

In general, removal effectiveness improves with increased particle size range and increased mass loading. For the expenditure of an effort of 4 nozzle-minutes (12 man-minutes) per 10^3 ft^2 , results ranged as follows:

<u>Particle Size Range</u> <u>(μ)</u>	<u>Nominal Mass Loading</u> <u>(g/ft²)</u>	<u>Removal Effectiveness</u> <u>(Residual Fraction)</u>
44 - 88	4.0	0.16
	24.0	0.07
350 - 700	4.0	0.005
	24.0	0.003

U.S. NAVAL RADIOLOGICAL
DEFENSE LABORATORY

SAN FRANCISCO • CALIFORNIA 94135

TRINITY GROUND ZERO:
8000 R/hr at 1 hour

1.4 R/hr at
57 days
11 Sept. 1945



LAND SURFACE BURST

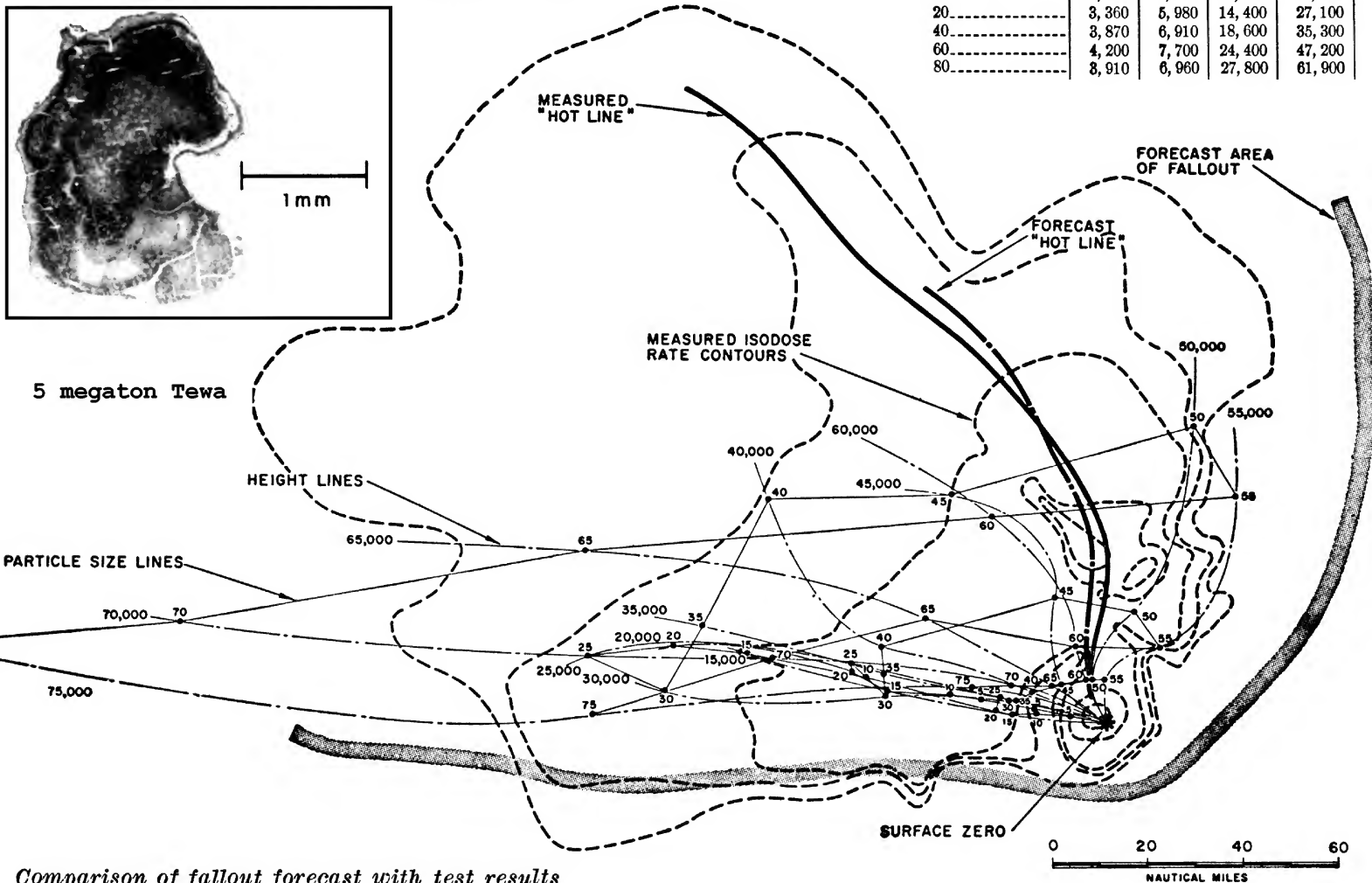
A FALLOUT FORECASTING TECHNIQUE WITH RESULTS OBTAINED AT THE
ENIWETOK PROVING GROUND

E. A. Schuert, USNRDL TR-139, United States Naval Radiological Defense
Laboratory, San Francisco, Calif.

2.36 g/cu cm irregular in shape

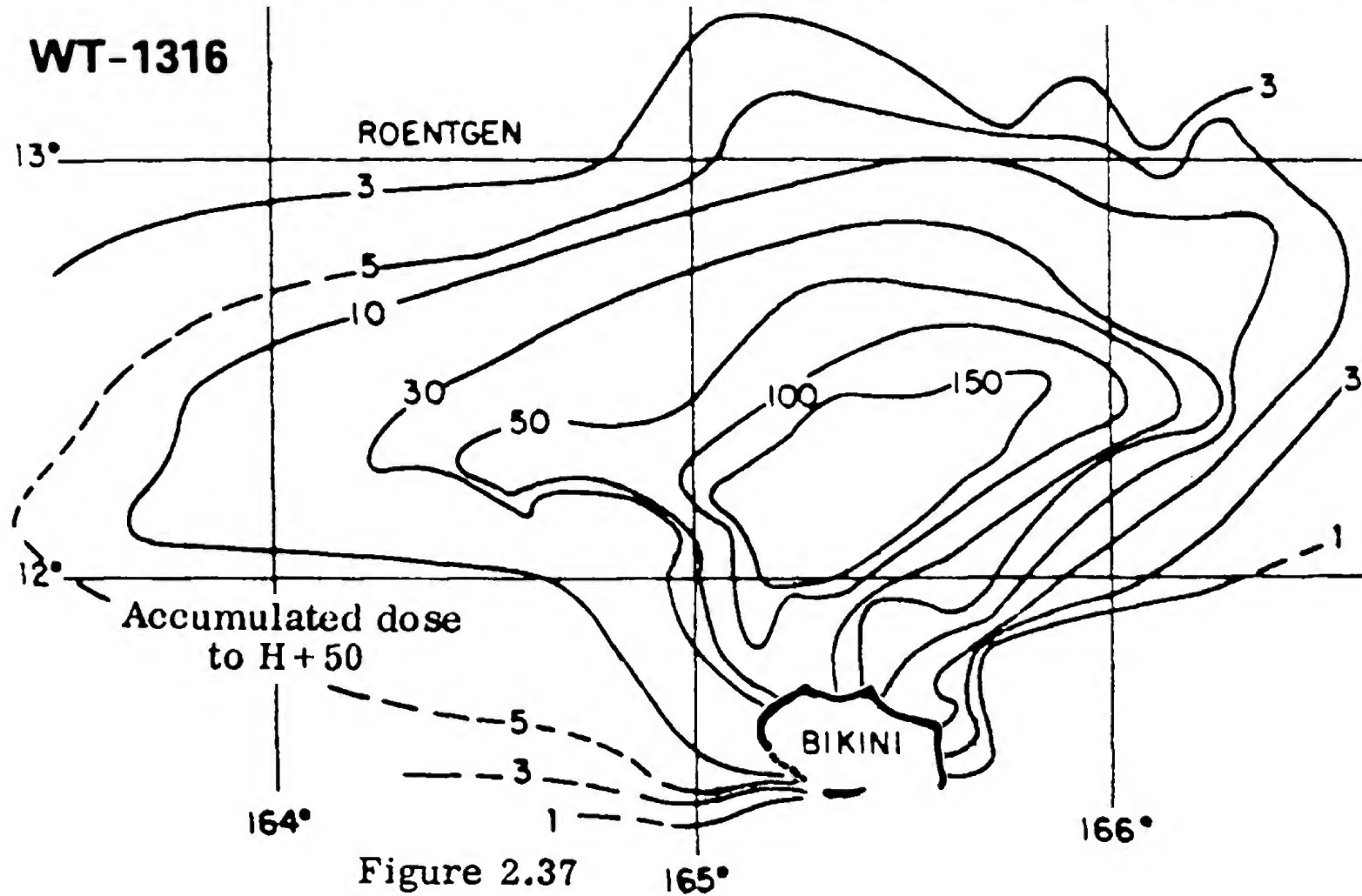
Falling speeds (feet/hour)

Altitude	75 μ	100 μ	200 μ	350 μ
0.....	3,060	5,040	11,700	21,600
20.....	3,360	5,980	14,400	27,100
40.....	3,870	6,910	18,600	35,300
60.....	4,200	7,700	24,400	47,200
80.....	3,910	6,960	27,800	61,900



CLEAN BOMB: 3.53 MT (15% FISSION) ZUNI

WT-1316



DIRTY BOMB: 5.01 MT (87% FISSION) TEWA

WT-1316

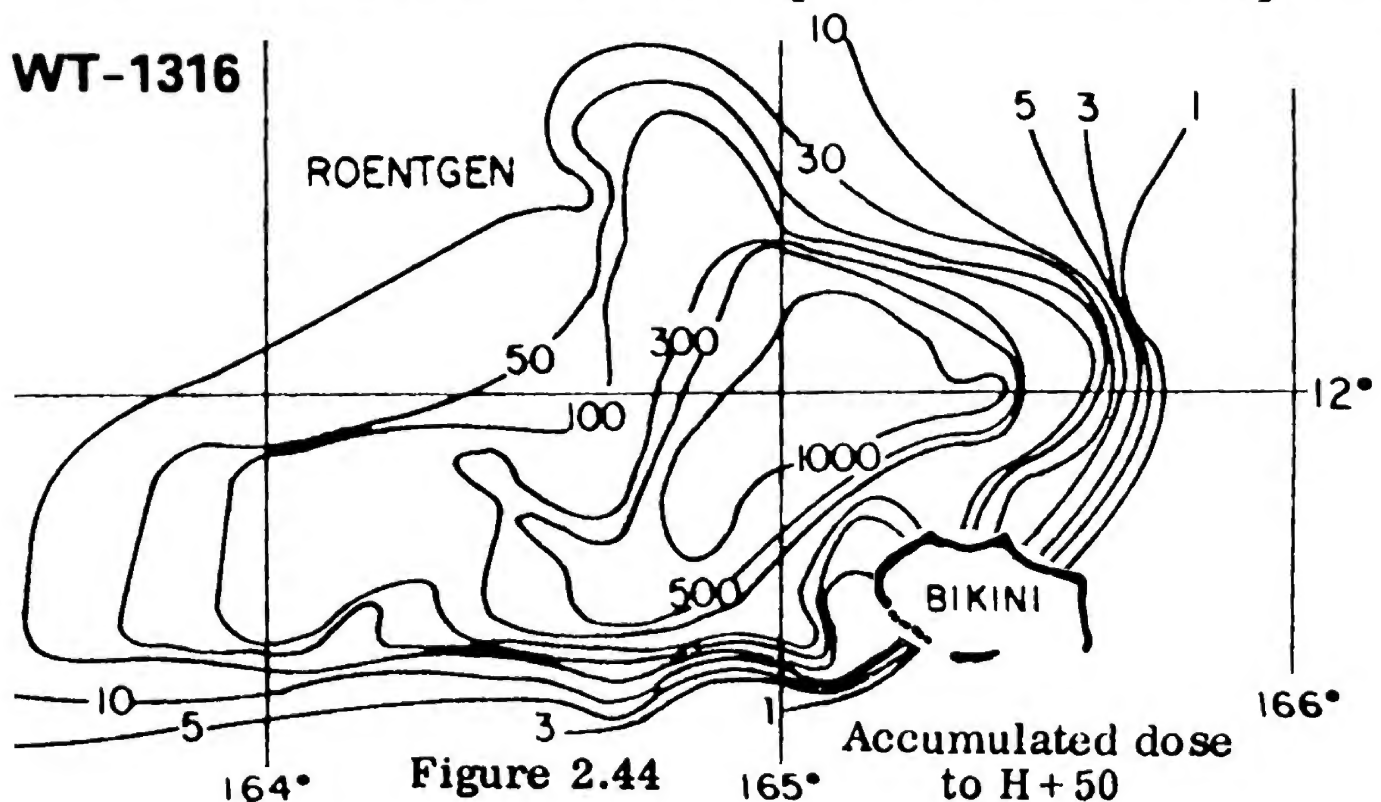


TABLE 2.11

	Navajo	Tewa
Total Yield, Mt	4.50	5.01
Fission proportion	5%	87%
H + 1 Hour Dose Rate (r/hr)	Area (mi²) Within Contour	
1,000	25	450
500	55	1,050
300	80	1,550
100	310	3,500
Two-day Dose, R	Area (mi²) Within Contour	
1,000	20	520
500	30	1,050
300	45	1,500
100	350	3,000

AD-A995490

POR-2266 (WT-2266)

TABLE 4.1

AREAS ENCLOSED BY DOSE RATE CONTOURS

0.018 kt 0.022 kt 0.5 kt 1.65 kt

Contour Dose Rate, I r/hr	Area Within Contour			
	Little Feller I	Little Feller II	Johnie Boy	Small Boy
	mi ²	mi ²	mi ²	mi ²
0.5	0.33	0.827	-	109.83
1.0	0.208	0.469	33.097	61.63
5.0	-	0.070	-	-
10.0	0.032	0.045	3.924	9.057
20.0	-	0.019	-	-
50.0	-	-	0.536	2.954
100.0	0.00478	0.005	0.214	1.200
200.0	-	-	-	0.285
1,000.0	-	-	0.0917	0.092
2,000.0	-	-	-	0.01665
10,000.0	-	-	0.0161	-
17,000.0	-	-	0.00537	-

1.65 KT SMALL BOY SURFACE BURST AT FRENCHMAN FLATS

GAMMA DOSE RATE AT 1 HOUR, R/HR **0.1**

8 KNOTS WIND WITH 30° SHEAR

(DNA-EM-1, Fig. 5-25)

1

10

0.01

1

0.1

100

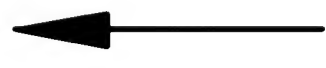
1000

0.01

Source: DASA-1251

**Note: Frenchman Flats Nevada is a dried lake bed,
with "virtually no particles above 150 microns in diameter"
down "to a depth of at least 30 feet" (report WT-2215, page 24)**

N



5

0

10

20

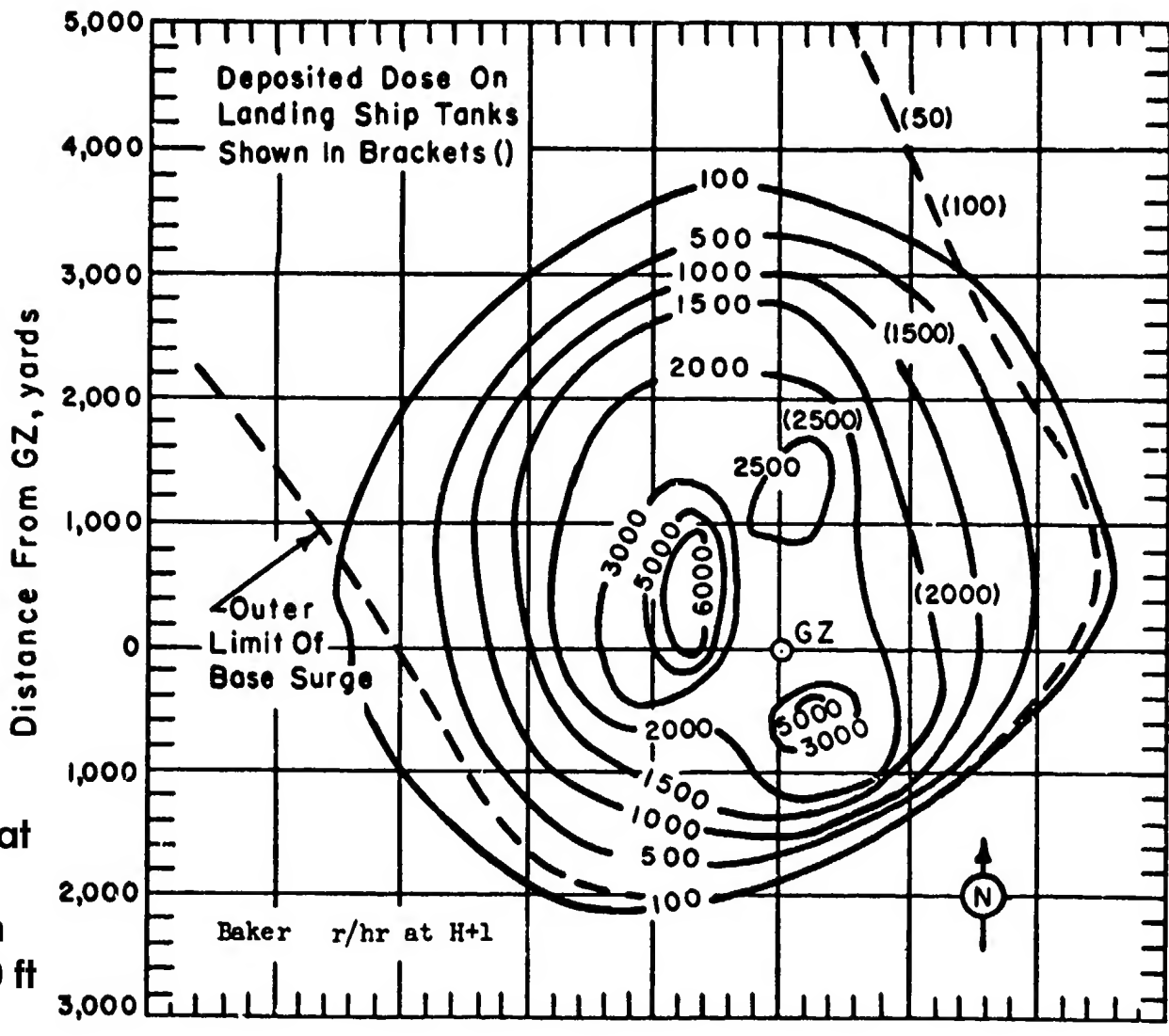
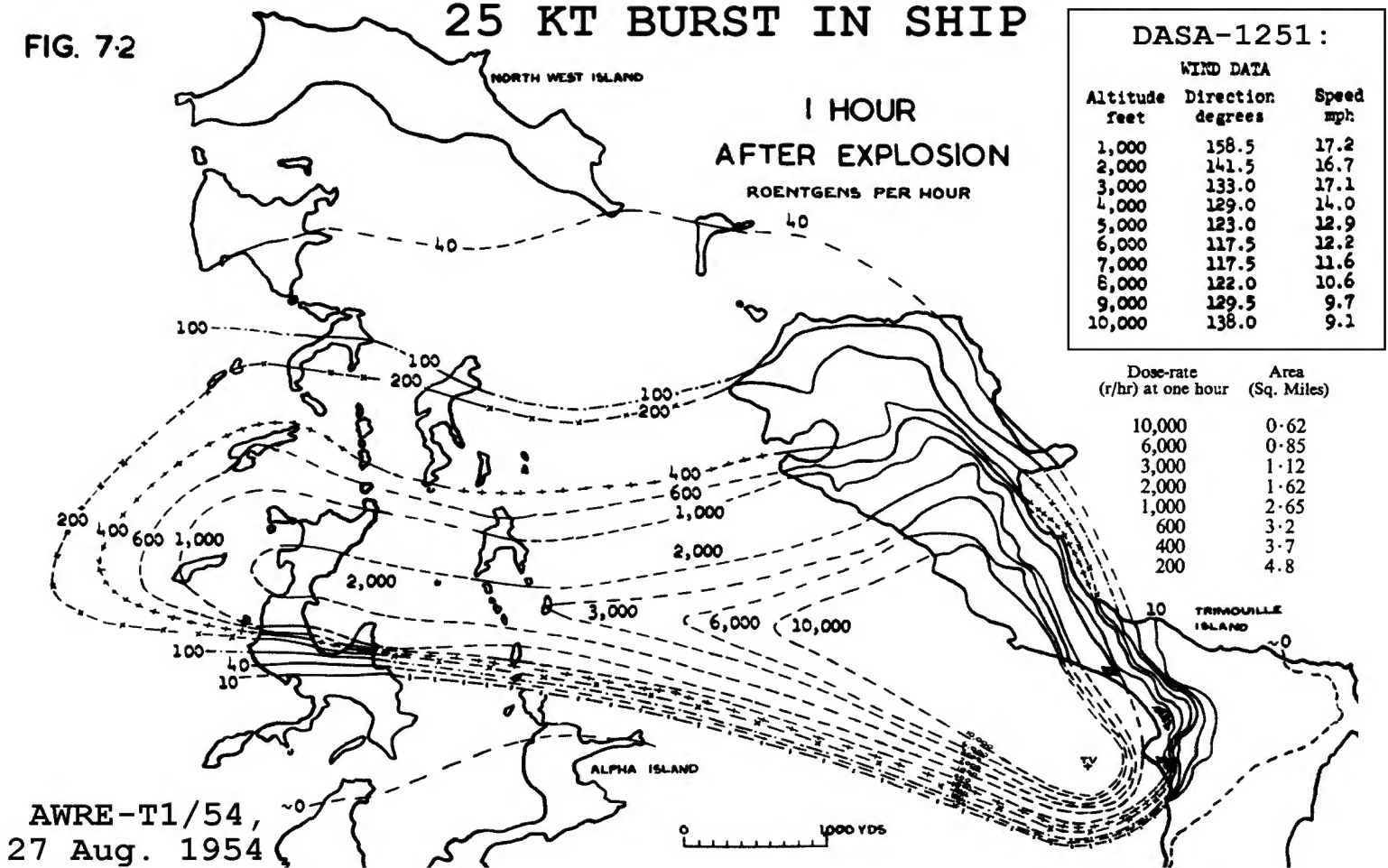
30

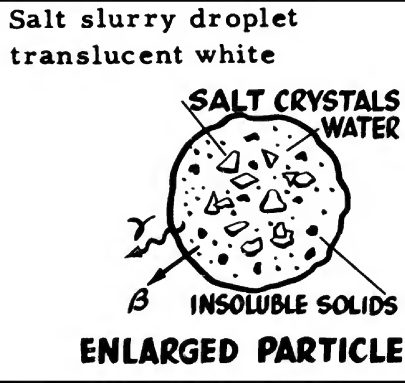
40

DISTANCE FROM GROUND ZERO, KILOFEET

OPERATION HURRICANE—THE DOSE-RATE CONTOURS OF THE RESIDUAL RADIOACTIVE CONTAMINATION 25 KT BURST IN SHIP

FIG. 7-2





WATER SURFACE BURST

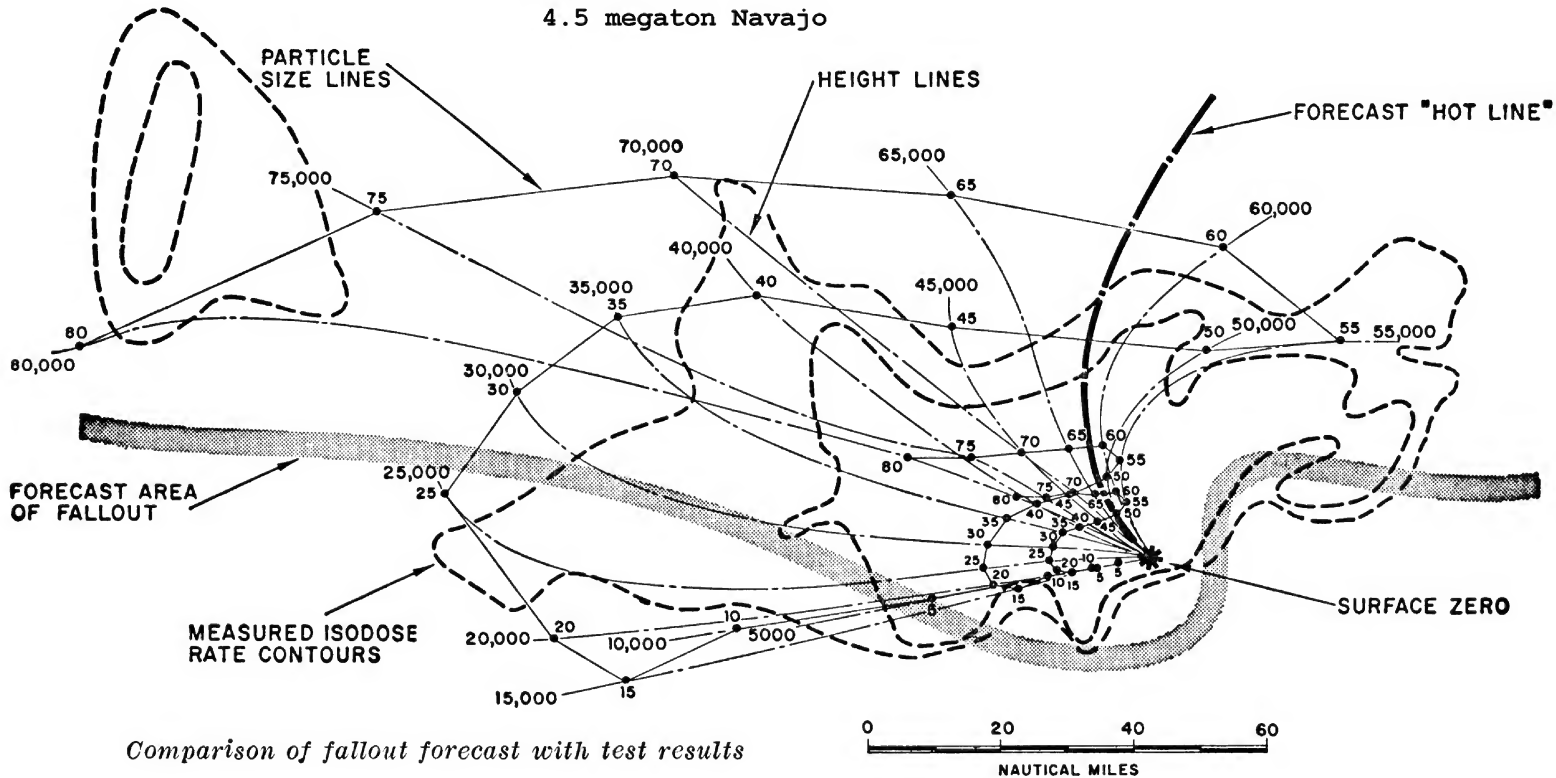
A FALLOUT FORECASTING TECHNIQUE WITH RESULTS OBTAINED AT THE ENIWETOK PROVING GROUND

E. A. Schuert, USNRDL TR-139, United States Naval Radiological Defense Laboratory, San Francisco, Calif.

Time variation of the winds aloft

In most of the observations made at the Eniwetok Proving Ground, the winds aloft were not in a steady state. Significant changes in the winds aloft were observed in as short a period as 3 hours. This variability was probably due to the fact that proper firing conditions which required winds that would deposit the fallout north of the proving ground, occurred only during an unstable synoptic situation of rather short duration.

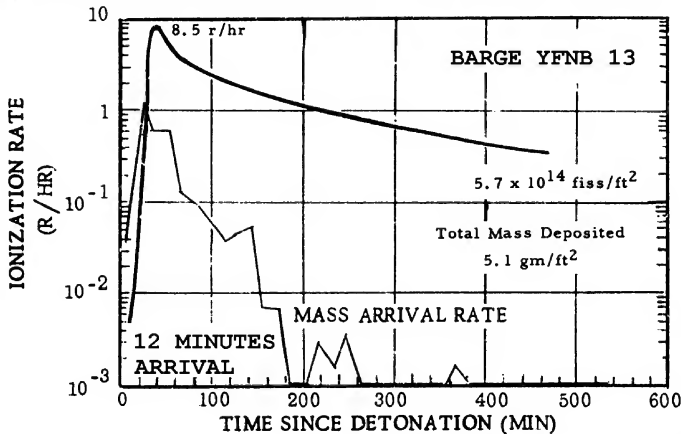
4.5 megaton Navaajo



Comparison of fallout forecast with test results

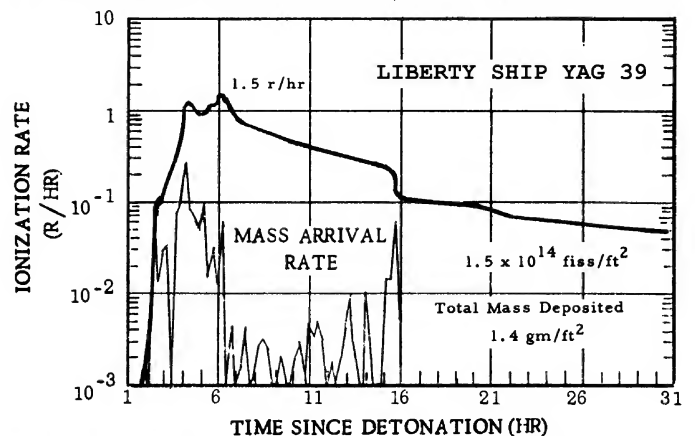
HEIGHT LINE = DESTINATIONS FOR A FIXED HEIGHT OF ORIGIN FOR VARIOUS SIZES
 SIZE LINE = DESTINATIONS FOR A FIXED PARTICLE SIZE FROM VARIOUS HEIGHTS
 HOT LINE = HEIGHT LINE FROM BASE OF MUSHROOM DISC (MAXIMUM FALLOUT)

4.5 MT NAVAJO (5% FISSION), 7.54 STAT. MILES W



Triffet, T. and LaRiviere, P. D.; Characterization of Fallout, Project 2.63

4.5 MT NAVAJO (5% FISSION), 21.0 STAT. MILES N



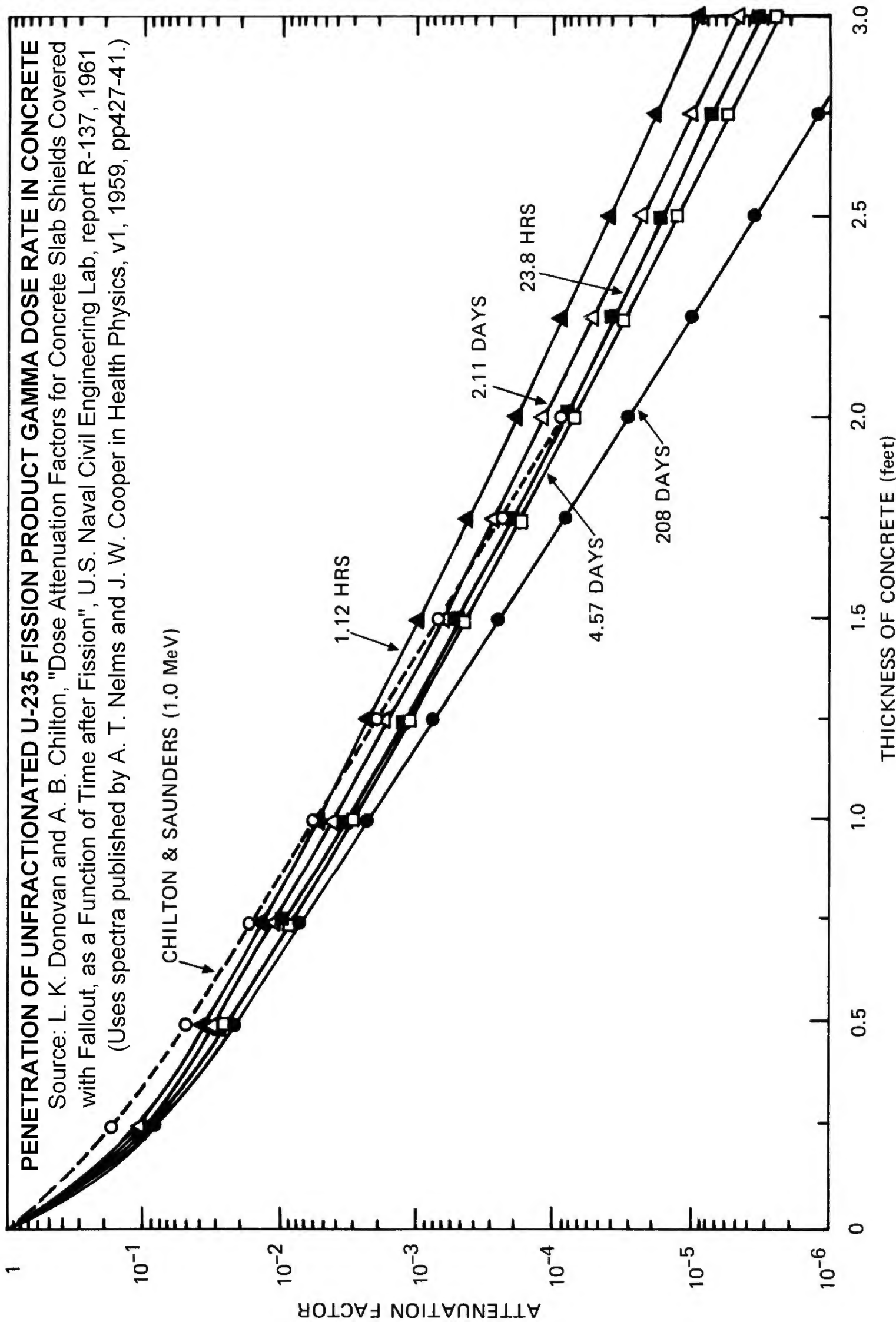
PENETRATION OF UNFRACTIONATED U-235 FISSION PRODUCT GAMMA DOSE RATE IN CONCRETE

Source: L. K. Donovan and A. B. Chilton, "Dose Attenuation Factors for Concrete Slab Shields Covered with Fallout, as a Function of Time after Fission", U.S. Naval Civil Engineering Lab, report R-137, 1961
(Uses spectra published by A. T. Nelms and J. W. Cooper in Health Physics, v1, 1959, pp427-41.)

CHILTON & SAUNDERS (1.0 MeV)

ATTENUATION FACTOR

THICKNESS OF CONCRETE (feet)



HOME OFFICE
SCOTTISH HOME DEPARTMENT

MANUAL OF CIVIL DEFENCE

Volume I

PAMPHLET No. 1

NUCLEAR WEAPONS

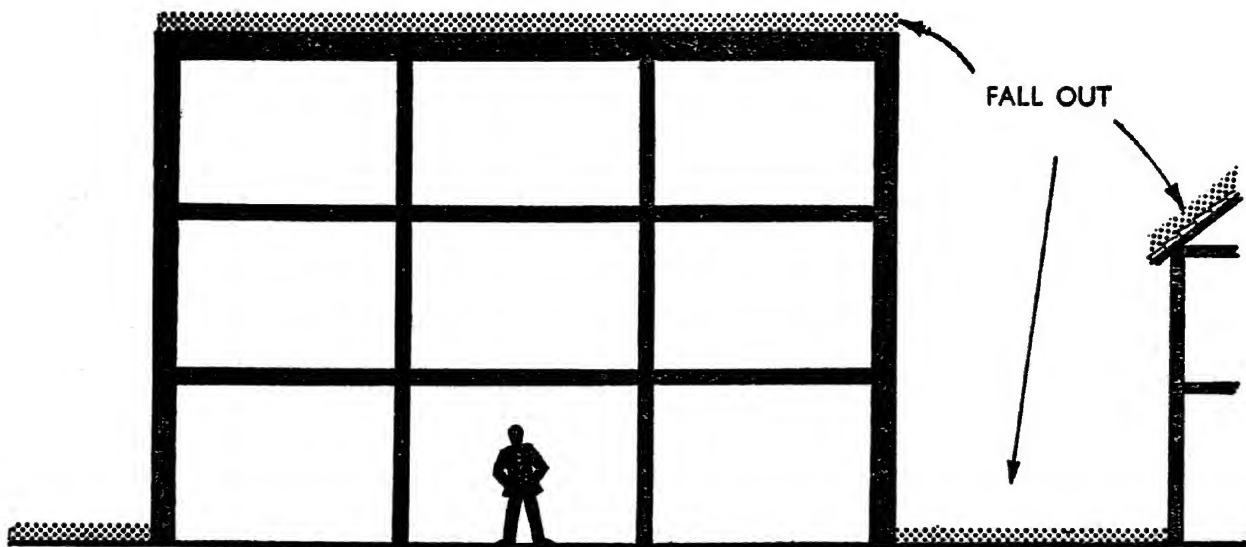
LONDON
HER MAJESTY'S STATIONERY OFFICE
1956

Practical protection

- 88** Large buildings with a number of storeys, especially if they are of heavy construction, provide much better protection than small single-storey structures (see Figure 4). Houses in terraces likewise provide much better protection than isolated houses because of the shielding effect of neighbouring houses.

GOOD PROTECTION

Solidly constructed multi-storeyed building with occupants well removed from fall-out on ground and roof. The thickness of floors and roof overhead, and the shielding effect of other buildings, all help to cut down radiation



BAD PROTECTION

Isolated wooden bungalow

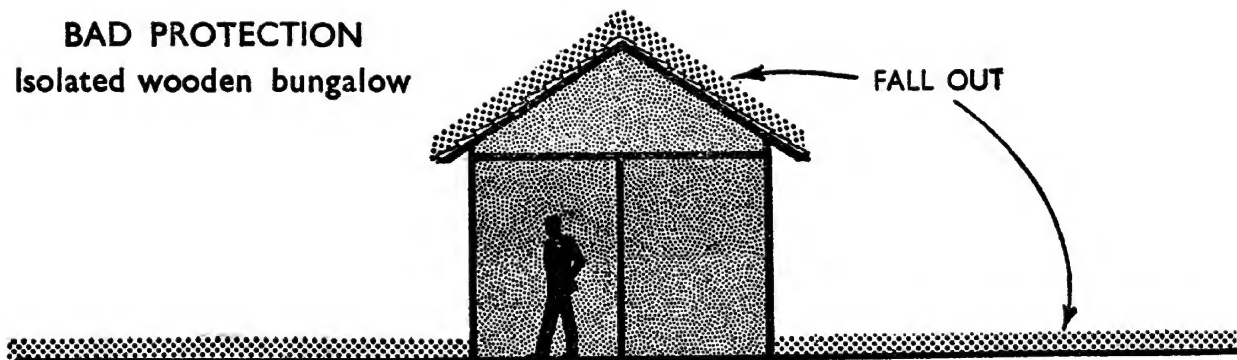


FIGURE 4

Examples of good and bad protection afforded by buildings against fall-out.

- 89** It is estimated that the protection factor (the factor by which the outside dose has to be divided to get the inside dose) of a ground floor room in a two-storey house ranges from 10 to about 50, depending on wall thickness and the shielding afforded by neighbouring buildings. The corresponding figures for bungalows are about 10–20, and for three-storey houses about 15–100. An average two-storey brick house in a built-up area gives a factor of 40, but basements, where the radiation from outside the house is attenuated by a very great thickness of earth, have protection factors ranging up to 200–300. A slit trench with even a light cover of boards or corrugated iron without earth overhead gives a factor of 7, and if 1 ft. of earth cover is added the

factor rises to 100. If the trench can be covered with 2 or 3 feet of earth then a factor of more than 200–300 can be obtained (see Figure 5).

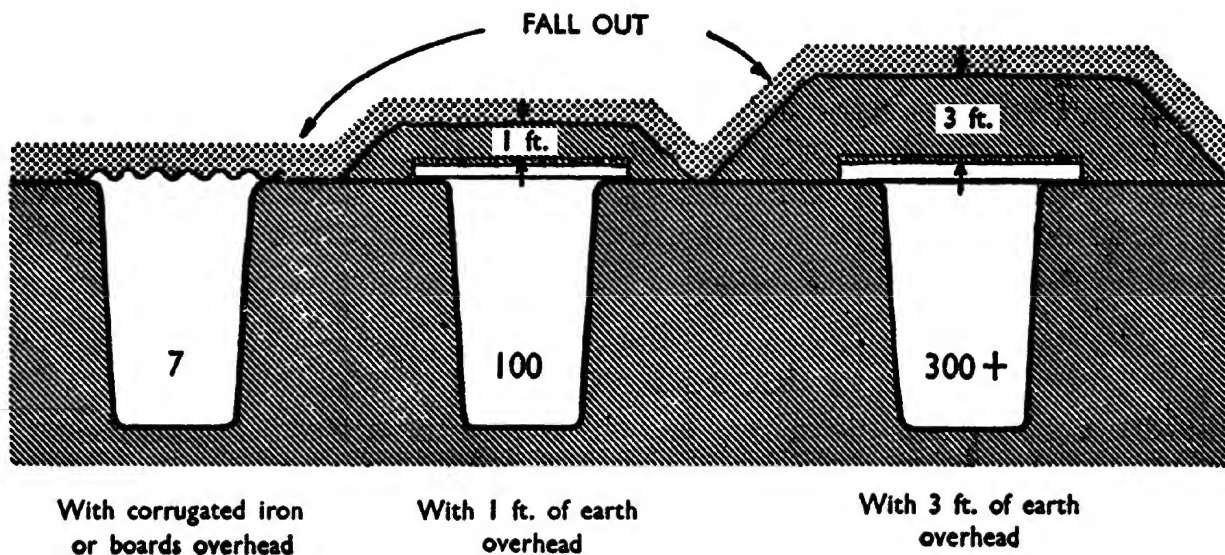


FIGURE 5

Protection factors in slit trenches (the factor by which the outside dose is divided to get the inside dose).

Choosing a refuge room

- 90** In choosing a refuge room in a house one would select a room with a minimum of outside walls and make every effort to improve the protection of such outside walls as there were. In particular the windows would have to be blocked up, e.g. with sandbags. Where possible, boxes of earth could be placed round an outside wall to provide additional protection, and heavy furniture (pianos, bookcases etc.) along the inside of the wall would also help. A cellar would be ideal. Where the ground floor of the house consists of boards and timber joists carried on sleeper walls it may be possible to combine the high protection of the slit trench with some of the comforts of the refuge room by constructing a trench under the floor.

Once a trap door had been cut in the floor boards and joists and the trench had been dug, there would be no further interference with the peace-time use of the room.

Estimated under-cover doses in the fall-out area

- 91** Taking an average protective factor of 40 for a two-storey house in a built-up area, the doses accumulated in 36 hours for the ranges referred to in the U.S. Atomic Energy Commission Report (paragraph 84) would have been:—

190 miles downwind	7½r
160 " "	12½r
140 " "	20r

*15 Megatons
Bravo 1954*

which are all well below the lowest figure of 25r referred to in Table 1. At closer ranges along the axis of the fall-out, the doses accumulated in 36 hours would have been much higher, but over most of the contaminated area—with this standard of protection—the majority of those affected would have been saved from death, and even from sickness, by taking cover continuously for the first 36 hours.

5. Radiation sickness

Assume dose incurred in a single shift (3–4 hours) by the “average” man, over the whole body:—

25 roentgens	—No obvious harm.
100 ,,	—Some nausea and vomiting.
500 ,,	—Lethal to about 50 per cent. people (death up to 6 weeks later).
800 ,,	or more—Lethal to all (death up to 6 weeks later).

Note: If dose spread uniformly over 2–3 days, then 60 roentgens could be incurred with no more effect than 25 roentgens in a single exposure of 3–4 hours.

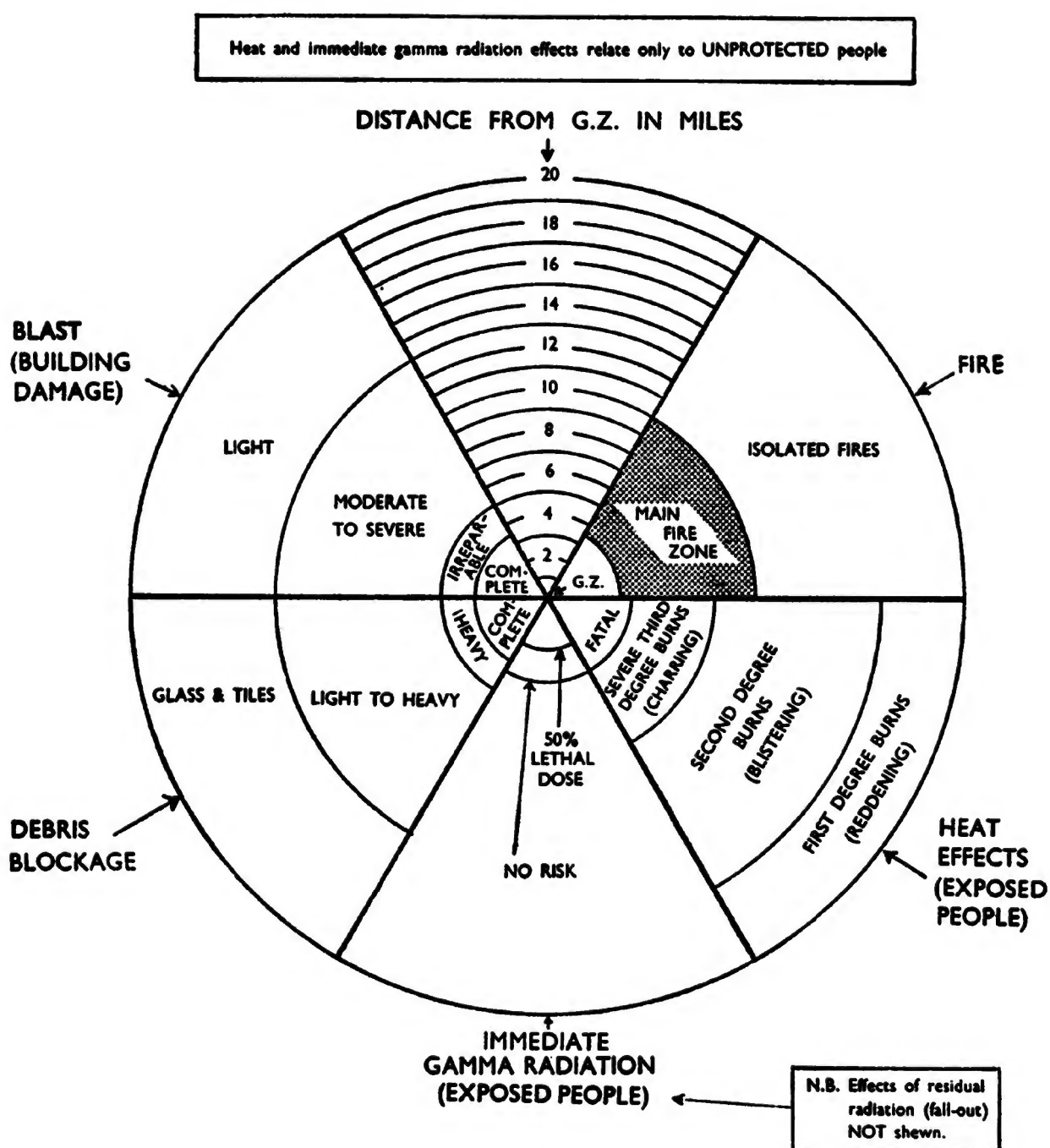


FIGURE 11

Combined effects (excluding residual radioactivity) from a 10 megaton ground burst bomb. Heat and immediate gamma radiation effects relate only to UNPROTECTED people.

HOME OFFICE
SCOTTISH HOME DEPARTMENT

MANUAL OF CIVIL DEFENCE

Volume I

PAMPHLET No. 2

RADIOACTIVE FALL-OUT

PROVISIONAL SCHEME OF
PUBLIC CONTROL

LONDON
HER MAJESTY'S STATIONERY OFFICE
1956

Radioactive Fall-out—Summary of Provisional Control Zones

Zone	Definition of Zone Boundaries	Range of Cumulative Doses in open at 48 hours	Summary of permissible and recommended action	Range of Cumulative Doses assuming observance of control rules
W	Outer: Limit of area placed under "Black Warning" (see Footnote). Inner: 0.3 r.p.h. at 48 hrs.	Up to 80r	Complete release from refuge as soon as dose-rate fell to 0.3 r.p.h. or, if the rate had not reached that figure, when fall-out was complete.	At 48 hrs. Below 2r
X	Outer: 0.3 r.p.h. at 48 hrs. Inner: 3 r.p.h. at 48 hrs.	80-800r	Qualified release from refuge after 48 hrs.—indoor workers to follow normal occupations, but not to exceed 4 hrs. per day in the open. Outdoor workers to work half shifts for next five days. At the end of this period the zone would be normal, except that all would be advised to be out of doors as little as possible and not in any case to exceed 8 hrs. per day in the open for the next three months.	At 48 hrs. 2-20r At 7 days 6-60r At 5 wks. 12-120r At 3 mths. 14-145r
Y	Outer: 3 r.p.h. at 48 hrs. Inner: 10 r.p.h. at 48 hrs.	800-2,800r	Release from refuge under stringent control after 48 hrs. For the next 12 days people should not leave their refuge for longer than necessary. Time in the open should not exceed 2 hrs. per day and time under cover, but not in refuge, a further 8 hrs. On this basis essential indoor workers should be able to get to their places of work, but outdoor work would remain suspended; a relaxation would be possible after the first fortnight and further easement in another three weeks. For the rest of the first year, however, people in this zone should not exceed 8 hrs. a day in the open.	At 48 hrs. 20-70r At 14 days 50-170r At 5 wks. 70-240r At 3 mths. 95-330r
Z	10 r.p.h. at 48 hrs.	Above 2,800r	All movement outside refuge accommodation in this zone would be dangerous. People should remain in refuge until instructions for clearance were given—they should then leave the zone by the quickest available route if they had means of transport or wait in their refuge to be collected if they had not. The clearance operation might start after 48 hrs. and removal from the zone would be for at least 3 months.	At 48 hrs.—Above 70r

The initial Zone W boundary would be defined by the boundaries of a series of warning districts on the flanks of the fall-out. After 48 hrs. Zone W would for public control purposes have disappeared; its outer boundary would have moved during the period to coincide with the outer boundary of Zone X. The question of defining an area extending in some places beyond Zone W in which there might be an agricultural hazard is being studied.

Environmental Radiation Protection Factors
Provided by Civilian Vehicles

Vehicle	Position	Protection Factor Range
Commercial bus (common type)	Throughout bus	1.5-2.0
Commercial bus (scenic cruiser type)	Throughout bus	1.5-2.0
School bus	Throughout bus	1.5-1.8
Passenger car	Passenger side (chest)	1.5-1.7
	Driver side	1.5-1.7
Pickup	Driver side	1.9-2.1
Crew cab	Driver side	1.8-2.0
	Back seat	1.8-2.0
Carryall	Driver side	1.7-1.9
	Rear side	1.7-1.9
2-1/2-ton truck	Driver side	1.8-2.0
	Center of bed	1.4-1.6
5-ton truck	Driver side	2.0-2.2
	Sleeper	1.9-2.1
Heavy Truck	Driver side	1.4-1.6
	Center of trailer	2.7-3.1
Fire truck	Driver side	2.7-3.1
	Standing area in back	1.6-1.8
Switch engine	Engineer's seat	3.0-3.5
Railway guard car	Sleeping quarters	2.2-2.6
	Kitchen area	2.4-2.8
	Center area	2.0-2.4
Heavy locomotive	Engineer's seat	3.0-3.5

SOURCE: Z. G. Burson, "Environmental and Fallout Gamma Radiation Protection Factors Provided by Civilian Vehicles," Health Physics, 26, 41-44, 1974.

PERSONAL AND FAMILY SURVIVAL

SM-3-11

“...the history of this planet and particularly the history of the 20th Century is sufficient to remind us of the possibilities of an irrational attack, a miscalculation, and accidental war, or a war of escalation in which the stakes by each side gradually increase to the point of maximum danger which cannot be either foreseen or deterred. It is on this basis that civil defense can be readily justified—as insurance for the civilian population in case of enemy miscalculation. It is insurance we trust will never be needed—but insurance which we would never forgive ourselves for foregoing in the event of catastrophe.”

— President Kennedy, in May 1961

Remove doors from their hinges and place them over supports



Drinking-water is required for survival. It is also useful as a shielding material. A collapsible children's swimming pool filled with water and located over the best corner of your basement will help improve the fallout protection. A bathtub, if suitably located, can also be used for this purpose.

**DEPARTMENT OF DEFENSE
OFFICE OF CIVIL DEFENSE**

Foreword

If the country were ever faced with an immediate threat of nuclear war, a copy of this booklet would be distributed to every household as part of a public information campaign which would include announcements on television and radio and in the press. The booklet has been designed for free and general distribution in that event. It is being placed on sale now for those who wish to know what they would be advised to do at such a time.

May 1980



Protect and Survive
ISBN 0 11 3407289

If Britain is attacked by nuclear bombs or by missiles, we do not know what targets will be chosen or how severe the assault will be.

If nuclear weapons are used on a large scale, those of us living in the country areas might be exposed to as great a risk as those in the towns. The radioactive dust, falling where the wind blows it, will bring the most widespread dangers of all. No part of the United Kingdom can be considered safe from both the direct effects of the weapons and the resultant fall-out.

The dangers which you and your family will face in this situation can be reduced if you do as this booklet describes.

Planning for survival

Stay at Home

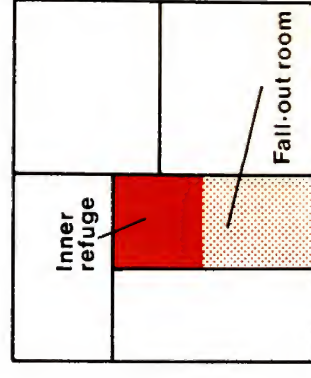
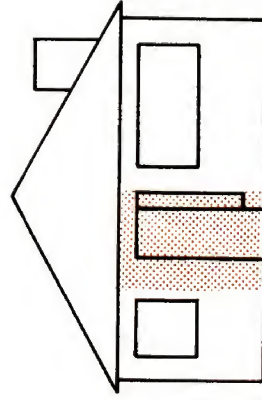
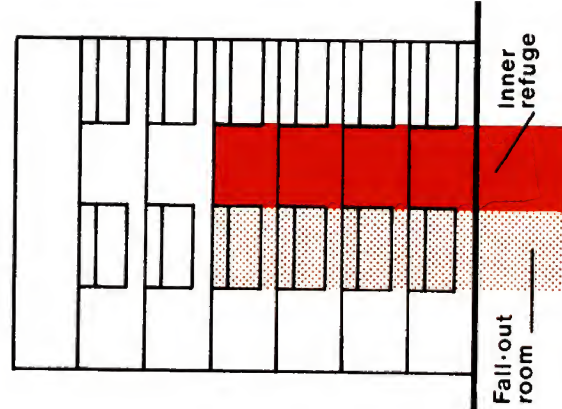
Your own local authority will best be able to help you in war. If you move away – unless you have a place of your own to go to or intend to live with relatives – the authority in your new area will not help you with accommodation or food or other essentials. If you leave, your local authority may need to take your empty house for others to use. So stay at home.

Plan a Fall-out Room and Inner Refuge

The first priority is to provide shelter within your home against radioactive fall-out. Your best protection is to make a fall-out room and build an inner refuge within it.

First, the Fall-out room

Because of the threat of radiation you and your family may need to live in this room for fourteen days after an attack, almost without leaving it at all. So you must make it as safe as you can, and equip it for your survival. Choose the place furthest from the outside walls and from the roof, or which has the smallest



Protect and Survive

UK Government, May 1980

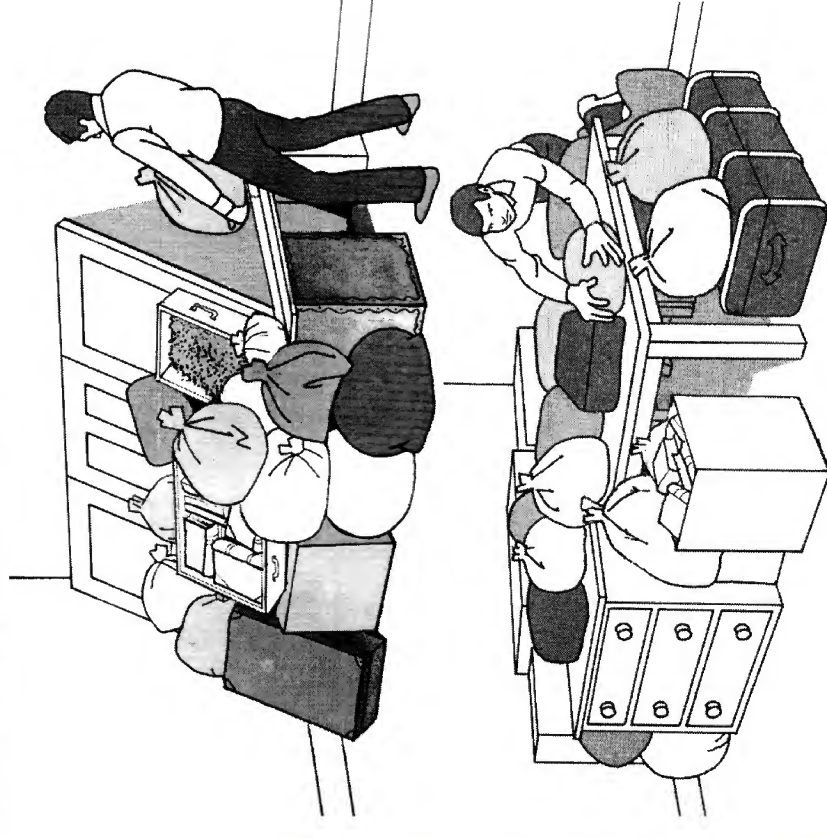
amount of outside wall. The further you can get, within your home, from the radioactive dust that is on or around it, the safer you will be. Use the cellar or basement if there is one. Otherwise use a room, hall or passage on the ground floor.

Now the Inner Refuge

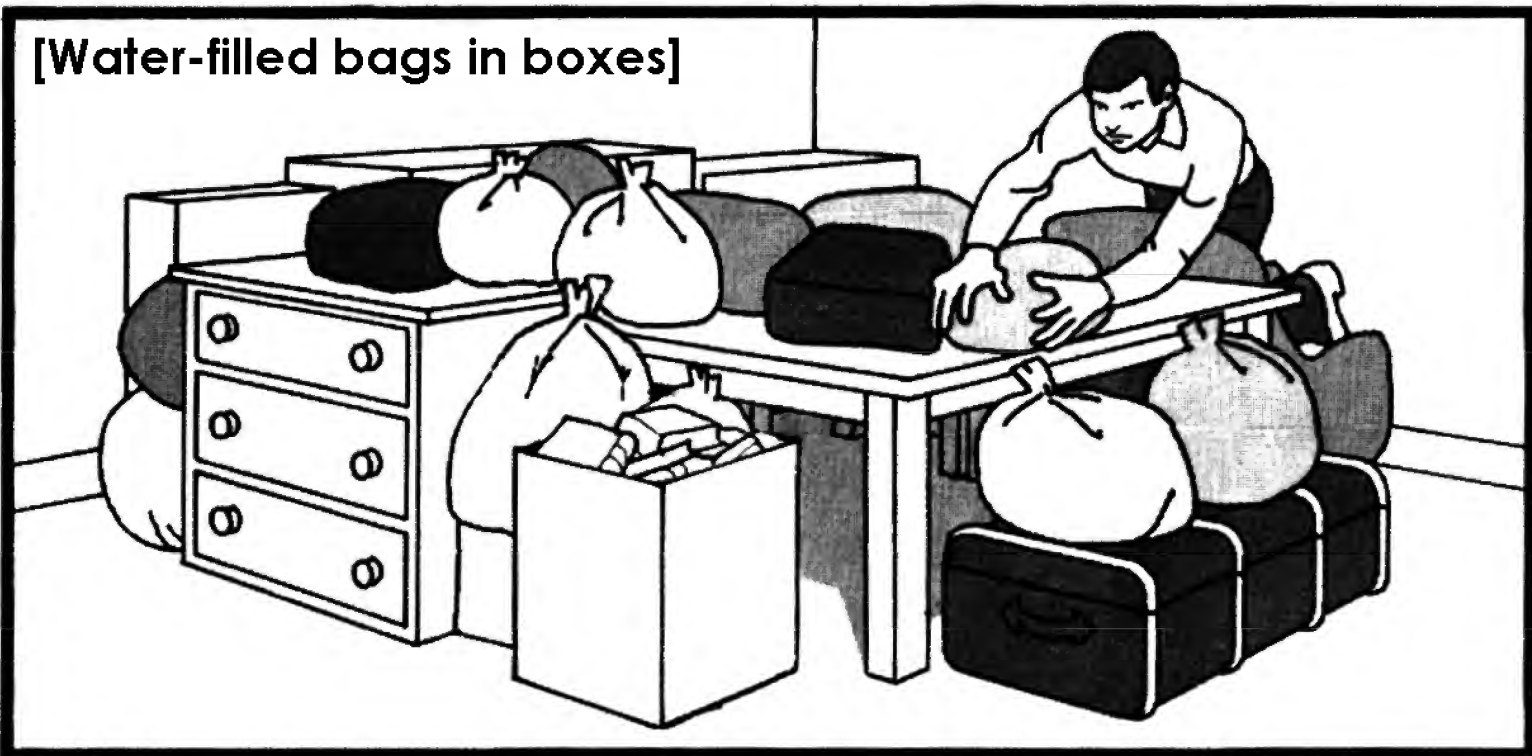
Still greater protection is necessary in the fall-out room, particularly for the first two days and nights after an attack, when the radiation dangers could be critical. To provide this you should build an inner refuge. This too should be thick-lined with dense materials to resist the radiation, and should be built away from the outside walls.

Here are some ideas:

Make a 'lean-to' with sloping doors taken from rooms above or strong boards rested against an inner wall. Prevent them from slipping by fixing a length of wood along the floor. Build further protection of bags or boxes of earth or sand – or books, or even clothing – on the slope of your refuge, and anchor these also against slipping. Partly close the two open ends with boxes of earth or sand, or heavy furniture.

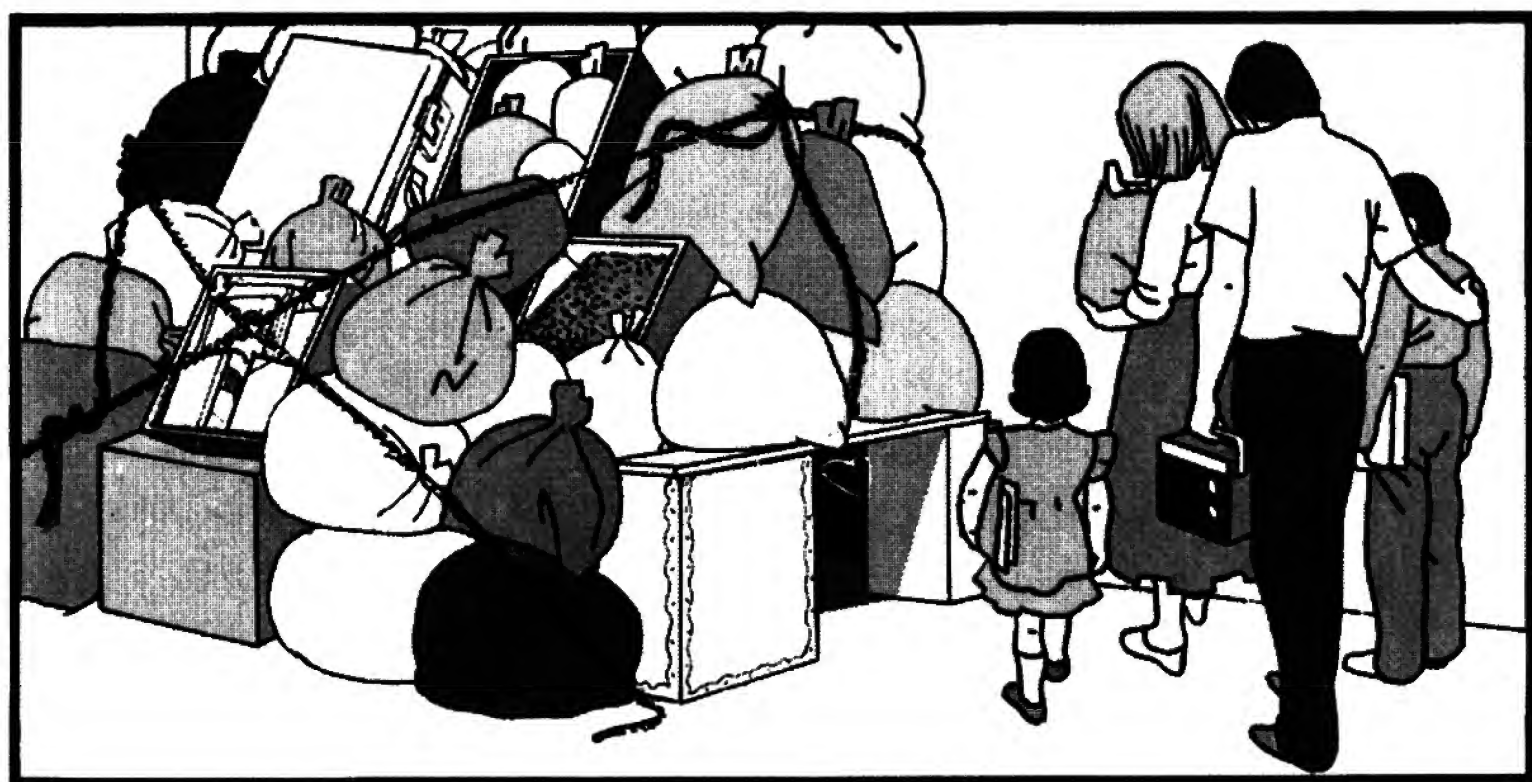


[Water-filled bags in boxes]



If there is structural damage from the attack you may have some time before a fall-out warning to do minor jobs to keep out the weather – using curtains or sheets to cover broken windows or holes.

If you are out of doors, take the nearest and best available cover as quickly as possible, wiping all the dust you can from your skin and clothing at the entrance to the building in which you shelter.



**Proceedings of the Symposium
held at Washington, D. C.**

April 19-23, 1965 by the

**Subcommittee on Protective Structures,
Advisory Committee on Civil Defense,
National Academy of Sciences—
National Research Council**

Protective Structures for

CIVILIAN POPULATIONS

1966

MODEL ANALYSIS

Mr. Ivor Ll. DAVIES
Suffield Experimental Station
Canadian Defense Research Board
Ralston, Alberta, Canada

Nuclear-Weapon Tests

In 1952 we fired our first nuclear device, effectively a "nominal" weapon, at Monte Bello, off north-west Australia. To the blast loading from this weapon we exposed a number of reinforced-concrete cubicle structures that had been designed for the dynamic loading conditions, and for which we made the best analysis of response we were competent to make at that time. Our estimates of effects were really a dismal failure. The structures were placed at pressure levels of 30, 10, and 6 psi, where we expected them to be destroyed, heavily damaged with some petaling of the front face, and extensively cracked, respectively. In fact, the front face of the cubicle at 30 psi was broken inwards; failure had occurred along both diagonals, and the four triangular petals had been pushed in. At the 10-psi level, where we had three cubicles, each with a different wall thickness (6, 9, and 12 in.), we observed only light cracking in the front face of that cubicle with the least thick wall (6 in.). The other two structures were apparently undamaged, as was the single structure at the 6-psi level.

In 1957, the first proposals were made for the construction of the underground car park in Hyde Park in London. The Home Office was interested in this project since, in an emergency, the structure could be used as a shelter. Consequently a request was made to us at Atomic Weapons Research Establishment (A.W.R.E.) to design a structure that would be resistant to a blast loading of about 50 psi, and to test our design on the model scale.

Using the various load-deformation curves obtained in this test, an estimate was made of the response of the structure to blast loading. Of particular interest was the possible effect of 100 tons of TNT, the first 100-ton trial at Suffield in Alberta.



10 p.s.i.



34 p.s.i.

Dynamic tests, Monte Bello cubicles.

A total of seven more models was made; six were shipped to Canada and placed with the top surface of the roof flush with the ground and at positions where peak pressures of 100, 80, 70, 60, 50, and 40 psi were expected. The seventh model was kept in England for static testing at about the time of firing. The results were not as expected. In the field, the four models farthest from the charge were apparently undamaged; we could see no cracking with the eye, nor did soaking the models with water reveal more than a few hair cracks. The model nearest the charge was lightly cracked in the roof panels and beams, and one of the columns showed slight spalling at the head. This model had been exposed to a peak pressure of 110 psi.

THE PROTECTION AGAINST FALLOUT RADIATION AFFORDED BY CORE SHELTERS IN A TYPICAL BRITISH HOUSE

Daniel T. Jones
Scientific Adviser, Home Office, London

Protective Factors in a Sample of British Houses (Windows Blocked)

Protective Factor	Percentage of Houses
< 25	36%
25-39	28%
40-100	29%
> 100	7%

"A very much improved protection could be obtained by constructing a shelter core. This means a small, thick-walled shelter built preferably inside the fallout room itself, in which to spend the first critical hours when the radiation from fallout would be most dangerous."⁽¹⁾

The full-scale experiments were carried out at the Civil Defense School at Falfield Park.⁽²⁾

In the staircase construction, the shelter consisted of the cupboard under the stairs, sandbags being placed on treads above and at the sides.

A 93 curies cobalt-60 source was used.

9 in. brick walls The windows and doors were not blocked	contribution r/hr/c/ft ²	Protective Factor		
	Position	Ground	Roof	
House only	E2	15.0	8.4	21
Lean-to	E2	10.4	2.4	39
Staircase cupboard:				
Stairs only sandbagged	N2	29.2	5.3	14
Stairs and outer wall sandbagged	N2	16.4	4.6	24
Stairs, outer wall, kitchen wall and corridor partition sandbagged	N2	8.8	1.8	47

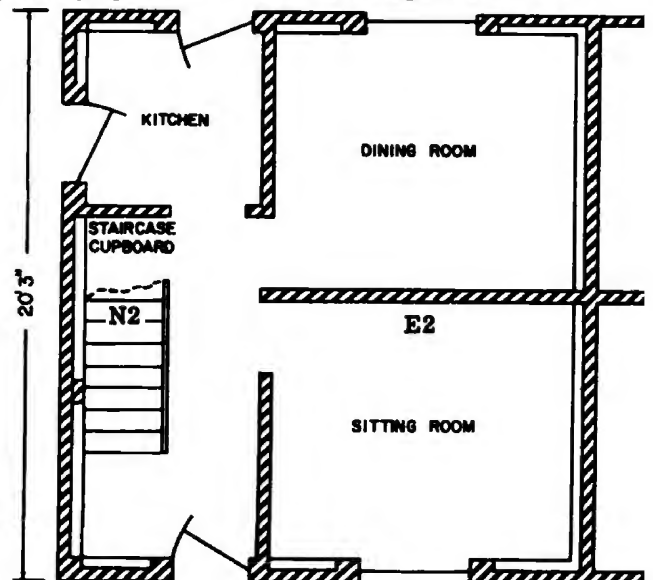
1. Civil Defence Handbook No. 10, HMSO, 1963.

2. Perryman, A. D., Home Office Report CD/SA 117.

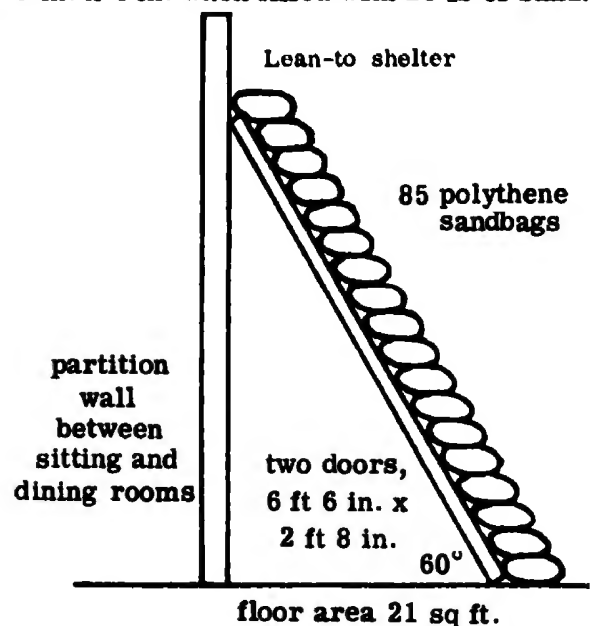
1. Six sandbags per tread, and a double layer on the small top landing. 96 sandbags were used.

2. As (1), together with a 4-ft-high wall of sandbags along the external north wall. 160 sandbags were used.

3. As (2), together with 4-ft-high walls of sandbags along the kitchen/cupboard partition wall and along the passage partition. 220 sandbags were used.



sandbags 24 in. x 12 in. when empty; 16 in. x 9 in. x 4 in. when filled with 25 lb of sand.



BLAST AND OTHER THREATS

Harold Brode
The RAND Corporation, Santa Monica, California

Chemical High-Explosive Weapons

As in past aerial warfare, bombs and missiles carrying chemical explosives to targets are capable of extensive damage only when delivered in large numbers and with high accuracy.

Biological Warfare

Most biological agents are inexpensive to produce; their effective dissemination over hostile territories remains the chief deterrent to their effective employment. Twenty square miles is about the area that can be effectively covered by a single aircraft; large area coverage presents a task for vast fleets of fairly vulnerable planes flying tight patterns at modest or low altitudes. While agents vary in virulence and in their biologic decay rate, most are quite perishable in normal open-air environments. Since shelter and simple prophylactic measures can be quite effective against biological agents, there is less likelihood of the use of biological warfare on a wholesale basis against a nation, and more chance of limited employment on population concentrations—perhaps by covert delivery, since shelters with adequate filtering could insure rather complete protection to those inside.

Chemical Weapons

Chemical weapons, like biological weapons, are relatively inexpensive to create, but face nearly insurmountable logistics problems on delivery. Although chemical agents produce casualties more rapidly, the greater amounts of material to deliver seriously limit the likelihood of their large-scale deployment. Furthermore, chemical research does not hold promise of the development of significantly more toxic chemicals for future use.

Radiological Weapons

The advantages of such modifications are much less real than apparent. In all weapons delivered by missiles, minimizing the payload and total weight is very important. If the total payload is not to be increased, then the inclusion of inert material to be activated by neutrons must lead to reductions in the explosive yield. If all the weight is devoted to nuclear explosives, then more fission-fragment activity can be created, and it is the net difference in activity that must be balanced against the loss of explosive yield. As it turns out, a fission explosion is a most efficient generator of activity, and greater total doses are not achieved by injecting special inert materials to be activated.

Perret, W.R., Ground Motion Studies at High Incident Overpressure, The Sandia Corporation, Operation PLUMBBOB, WT-1405, for Defense Atomic Support Agency Field Command, June 1960.

The Neutron Bomb

The neutron bomb, so called because of the deliberate effort to maximize the effectiveness of the neutrons, would necessarily be limited to rather small yields—yields at which the neutron absorption in air does not reduce the doses to a point at which blast and thermal effects are dominant. The use of small yields against large-area targets again runs into the delivery problems faced by chemical agents and explosives, and larger yields in fewer packages pose a less stringent problem for delivery systems in most applications. In the unlikely event that an enemy desired to minimize blast and thermal damage and to create little local fallout but still kill the populace, it would be necessary to use large numbers of carefully placed neutron-producing weapons burst high enough to avoid blast damage on the ground, but low enough to get the neutrons down. In this case, however, adequate radiation shielding for the people would leave the city unscathed and demonstrate the attack to be futile.

The thermal radiation from a surface burst is expected to be less than half of that from an air burst, both because the radiating fireball surface is truncated and because the hot interior is partially quenched by the megatons of injected crater material.

SUPERSEISMIC GROUND-SHOCK MAXIMA (AT 5-FT DEPTH)

Vertical acceleration: $\alpha_{vm} \approx 340 \Delta P_g / C_L \pm 30$ per cent. Here acceleration is measured in g's and overpressure (ΔP_g) in pounds per square inch. An empirical refinement requires C_L to be defined as the seismic velocity (in feet per second) for rock, but as three fourths of the seismic velocity for soil.

OUTRUNNING GROUND-SHOCK MAXIMA (AT ~10-FT DEPTH)

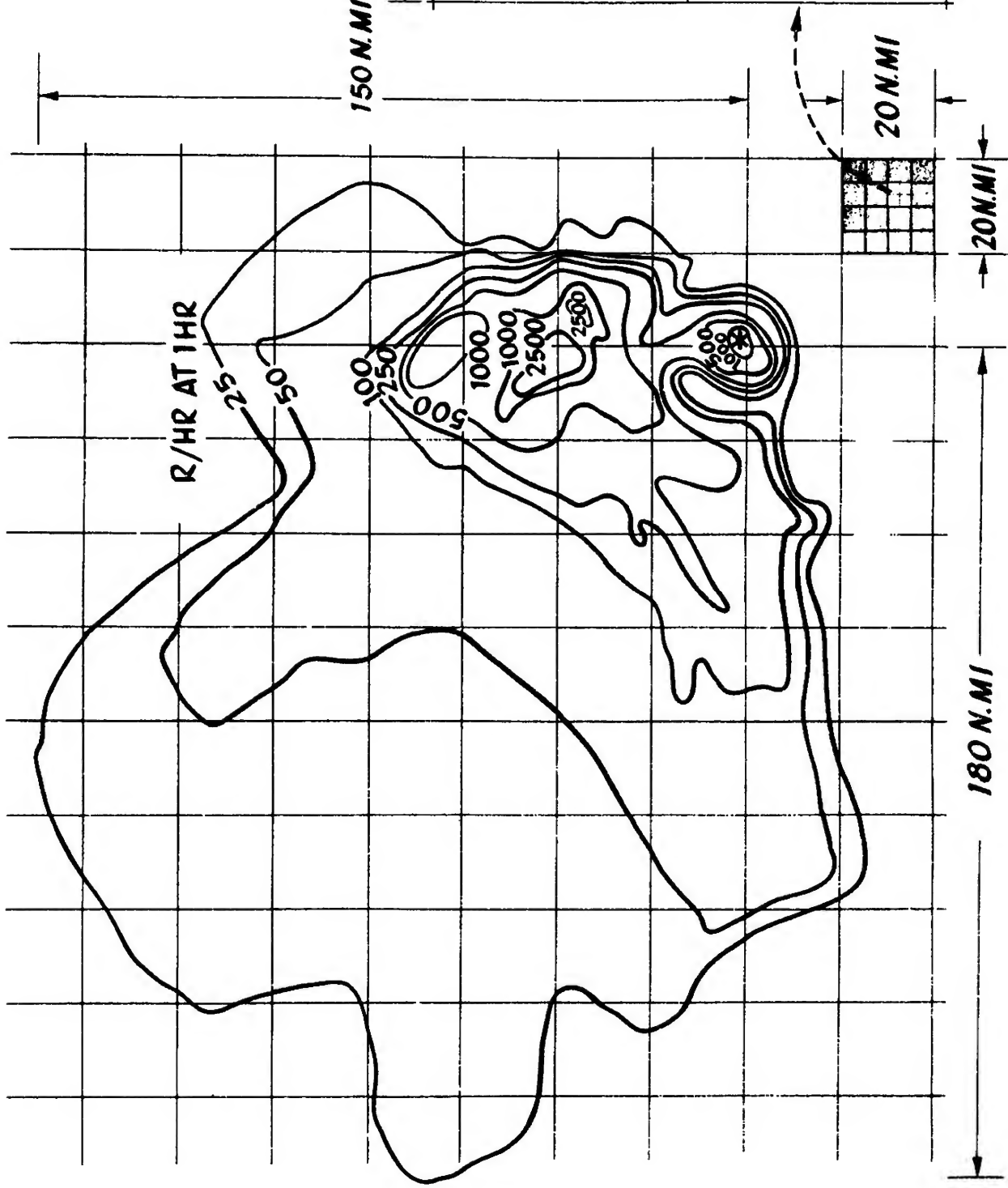
Vertical acceleration: $\alpha_{vm} \approx 2 \times 10^5 / C_L r^2$ + factor 4 or -factor 2. Acceleration is measured in g's, and r is the scaled radial distance—i.e., $r = R/W^{1/3}$ kft/(mt)^{1/3}.

Data taken on a low air-burst shot in Nevada indicate an exponential decay of maximum displacement with depth. For the particular case of a burst of ~40 kt at 700 ft, some measurements were made as deep as 200 ft below the surface of Frenchman Flat, a dry lake bed, which led to the following approximate decay law, according to Perret.

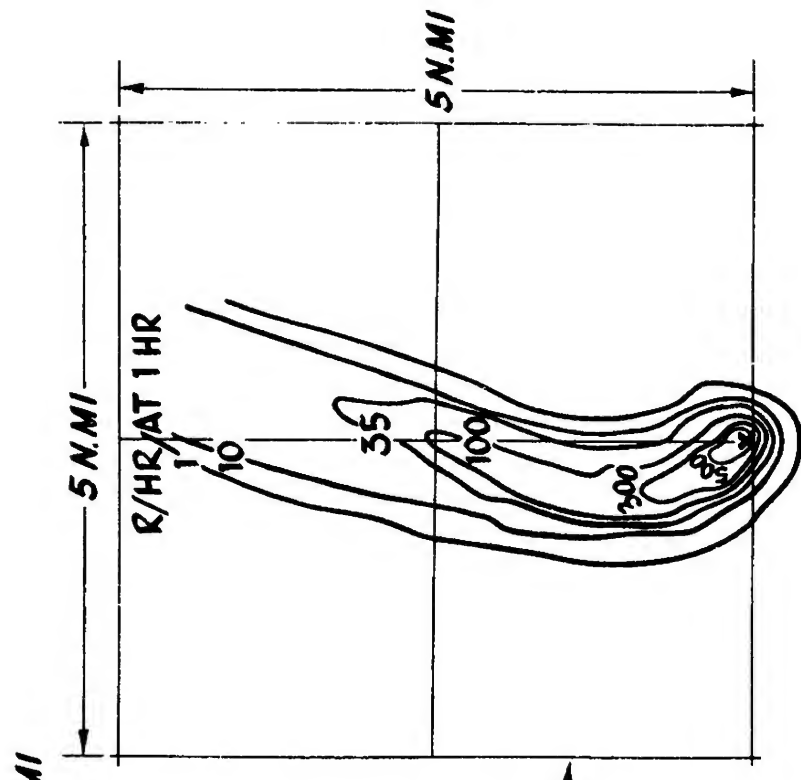
$$\delta = \delta_0 \exp(-0.017D),$$

where δ represents the maximum vertical displacement induced at depth D , δ_0 is the maximum displacement at the surface, and D is the depth in feet.

COMPARISON of FALLOUT CONTOURS



5MT BURST



1KT BURST



MINISTRY OF HOME SECURITY

AIR RAIDS

What You must know
What You must do

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LONDON: H. M. STATIONERY OFFICE

Price 3d. Net or 10s. for 50.

FOREWORD

BY

SIR JOHN ANDERSON, G.C.B., G.C.S.I., G.C.I.E., M.P.
Minister of Home Security.

This book is written to help you and your family and your friends.

There has been built up in the last few years a vast organisation for Civil Defence; and, thanks to the devotion of a great army of volunteers, the services which it comprises have been welded into a highly efficient force. This organisation is briefly described in the first chapter, which has been included in this book for two reasons; first, because I may, in the near future, have to call on many of you to give some part of your time to one or other of these services, and secondly, because you may need the help of the services and should therefore understand something about them.

But the Civil Defence services alone cannot protect you from the consequences of air raids. Your own protection and the protection of your family must, in large measure, depend on your taking certain necessary precautions. You can yourself do much to minimise risk to yourself and to those dependent on you.

A great deal of information has been collected as a result of experience gained in actual air raids, and from this and from research and experiment the basic principles on which the protection of life and limb and property depends have been worked out and are set down here for your guidance. They are simple to understand and easy to carry out; and if you will act on them you will be able to face the dangers of air raids with the sure conviction that you have done all in your power for the safety of those depending on you, and with the calmness and assurance that come from a knowledge of the way in which these dangers can be met. In this way you will be helping not only yourself, but the Nation, for it is through the strengthening of your powers of resistance that the people of this country will be enabled to defeat every attempt the enemy may make to weaken its morale and paralyse its war effort.

In this war every man and woman is in the front line. A soldier at the front who neglects the proper protection of his trench does more than endanger his own life; he weakens a portion of his country's defences and betrays the trust which has been placed in him. You, too, will have betrayed your trust if you neglect to take the steps which it is your responsibility to take for the protection of yourself and your family.

This is a contribution to the winning of final victory which you personally can make and which no one else can make for you. I am confident that you will make it.



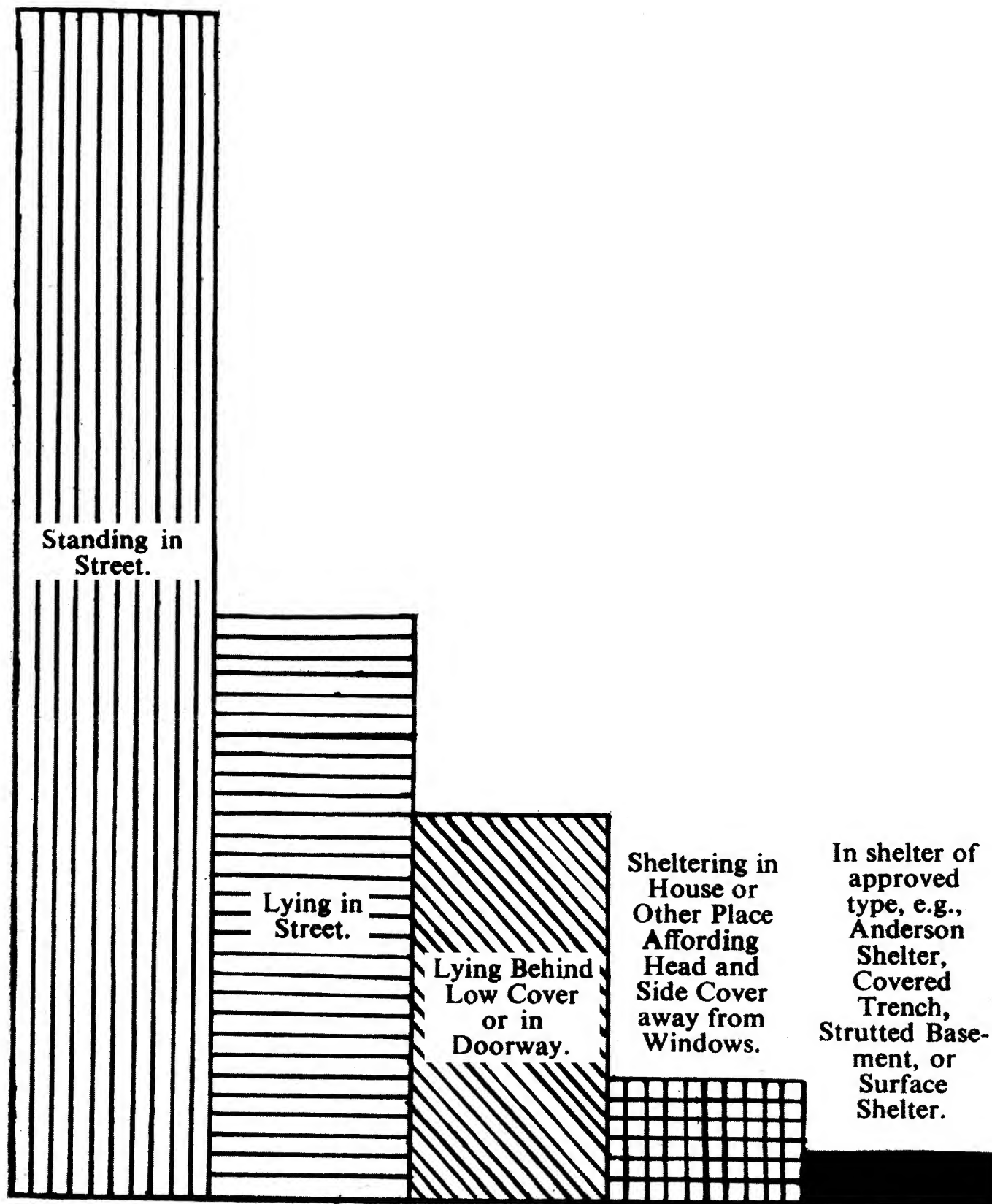
Ministry of Home Security.

June, 1940.

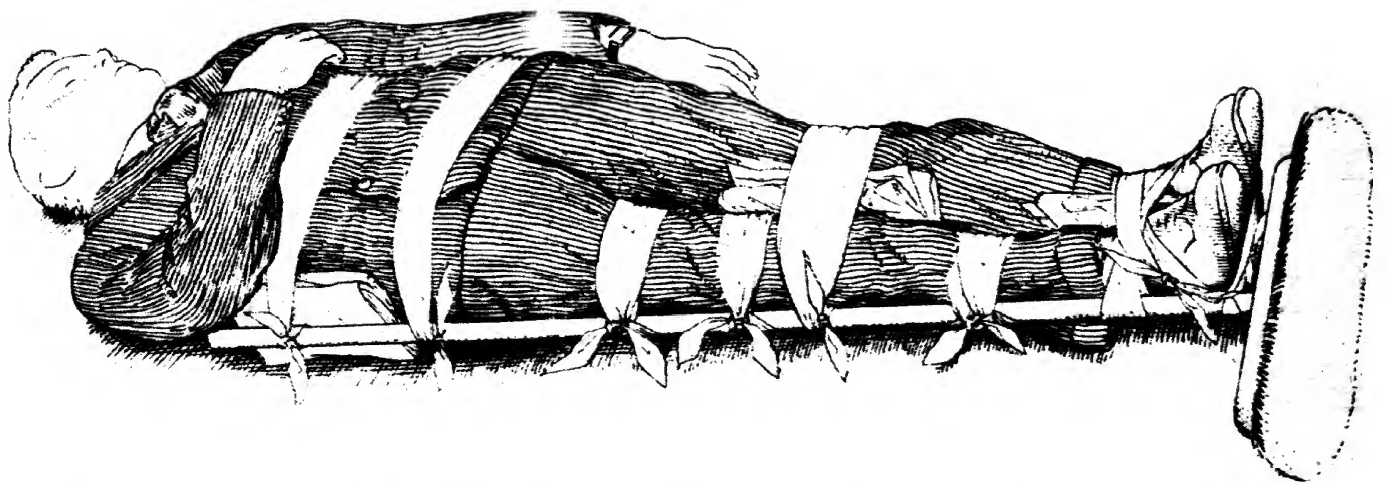
Tools.

A number of tools such as picks, shovels, and crowbars should be kept in a shelter to be used in forcing a way out if the occupants are trapped. When the accommodation is being fitted out, it should be discovered where the weakest part of the structure is, or where it would be most suitable to work, should it become necessary to break a way out. This position should be clearly marked for the benefit of all.

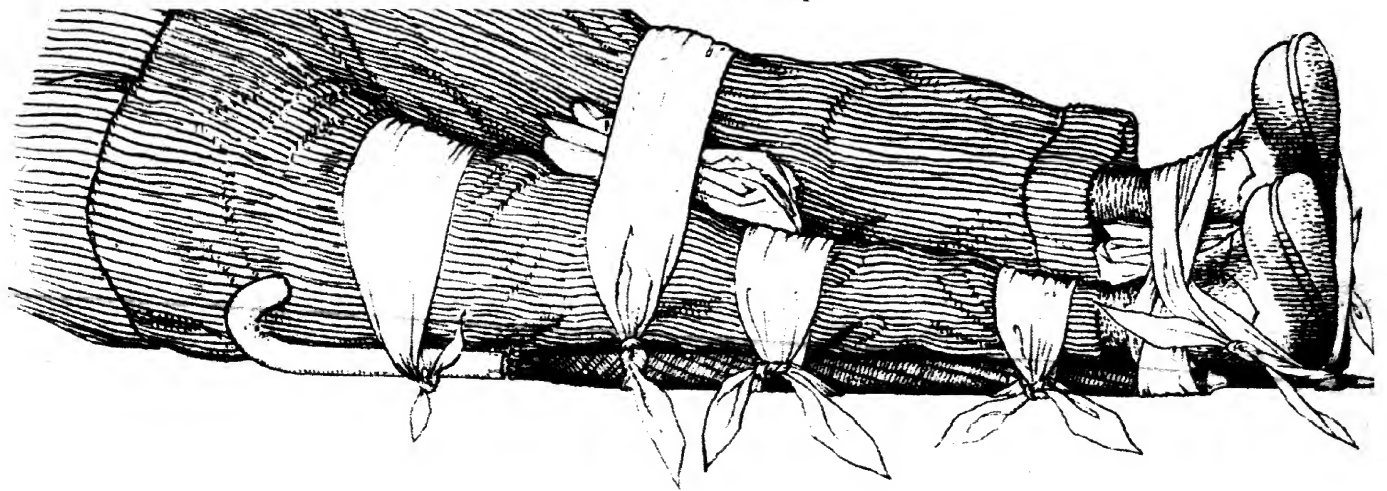
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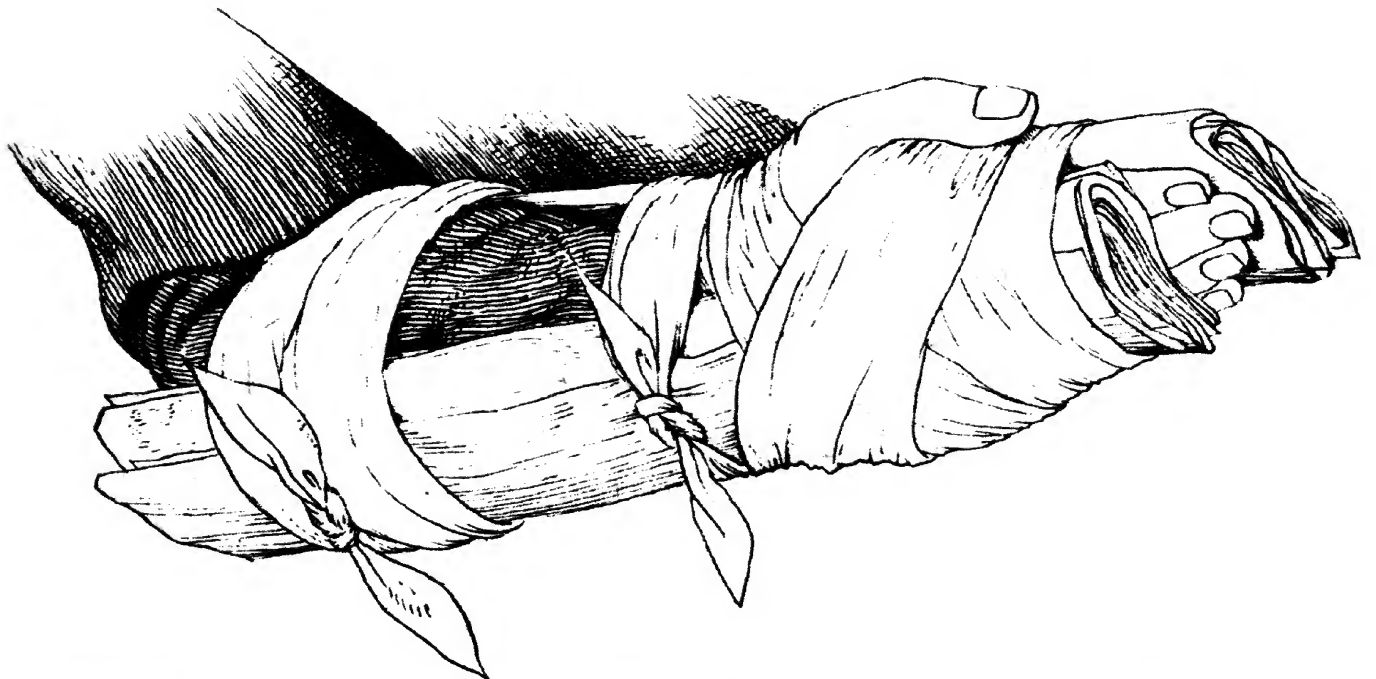
This diagram is based on a large number of reports of the results of recent air raids and is an approximate indication of the difference in the degree of risk resulting from taking cover in various ways.



A broom used as a thigh splint by placing the handle along the injured limb, with the head of the broom at the feet. Loosely folded pieces of newspaper or other material may be used as padding, placed between the ankle and knee joints, and also at the hip.



Sketch II.—Simple fracture through middle third of tibia (shin-bone). The illustration shows an umbrella used as a splint. The ankles and knee joints are padded with loosely folded newspaper.



Sketch III. Simple fracture through one or both bones of the forearm.

The illustration shows the use of newspaper, folded to the approximate size of an arm splint, so as to be stiff enough to give rigid support.

AN ANALYSIS OF 259 OF THE RECENT FLYING-BOMB CASUALTIES

BY

R. C. BELL, M.B., M.R.C.S.*Resident Surgical Officer to an E.M.S. Hospital*

In all we dealt with 222 out-patients and 259 in-patients, with 18 deaths. Our story began in June, 1944, when the first large incident occurred near by. Twenty-six casualties were admitted and 12 required theatre treatment. This proportion remained fairly constant throughout the series. Altogether we had 83 theatre cases out of 259 admissions, and had to send 35 cases on untreated, most of whom required the theatre. In this first incident no fewer than 16 of the casualties were due to flying glass. It was noticeable how the proportion of glass injuries dropped as the importance of taking adequate cover was realized, while the percentage of crush injuries increased from people being trapped by falling masonry.

A. Flying Glass

This was the most frequent cause of injury, totalling over 100 casualties in all. Many included severe damage to the eyes. It is noticeable that most of the injuries were above the nipple line, chiefly of the face and neck: a large proportion were received when looking out of windows—a modern version of curiosity killing the cat. We had five cases of perforating wounds of both eyes and ten perforating wounds of one eye. The globe was usually completely destroyed. Many of these injuries were avoidable, and therein lay their great sadness.

The penetrating power of flying glass is, in the main, low. It is unusual for it to pierce the deep fascia: usually it lies just under the skin in the fat, but when present in hundreds of pieces it presents a problem which has not yet acquired a satisfactory solution; nor has the condition made its way into the textbooks of war surgery.

TABLE I.—*Glass*

Description	No.	Remarks	Deaths
Lacerations of face, scalp, and neck ..	77	19 T	—
Perforating wounds of eye	15	5 cases bilateral 2 T	—
Cut hands	9		
Severe multiple lacerations	6	1 T	1
Other injuries	5	—	—

NUMBER AND CLASSIFICATION OF OFFICIAL EVACUEES IN GREAT BRITAIN IN 1939 AND 1940

	SEPTEMBER, 1939		JANUARY, 1940	
	Number	Percentage Distribution	Number	Per cent of Those in September, 1939
900,000 of the 1.5 million returned to the target areas after four months of war.				
1. Unaccompanied school children.....	826,959	56.1	457,600	55
2. Mothers and accompanied children....	523,670	35.5	64,900	12
3. Expectant mothers.....	12,705	0.9	1,140	9
4. Blind persons, cripples, and other special classes.....	7,057	0.5	2,440	35
5. Teachers and helpers.....	103,000	7.0	46,500	45
Total.....	1,473,391	100.0	572,580	39

Source: R. M. Titmuss, *Problems of Social Policy* (London: H.M. Stationery Office, 1950), pp. 103 and 172.

Effectiveness of Some Civil Defense Actions in Protecting Urban Populations (u)

Appendix B of Defense of the US against Attack by Aircraft and Missiles (u)

ORO-R-17, Appendix B

ORO-R-17 (App B)

~~CONFIDENTIAL~~

28

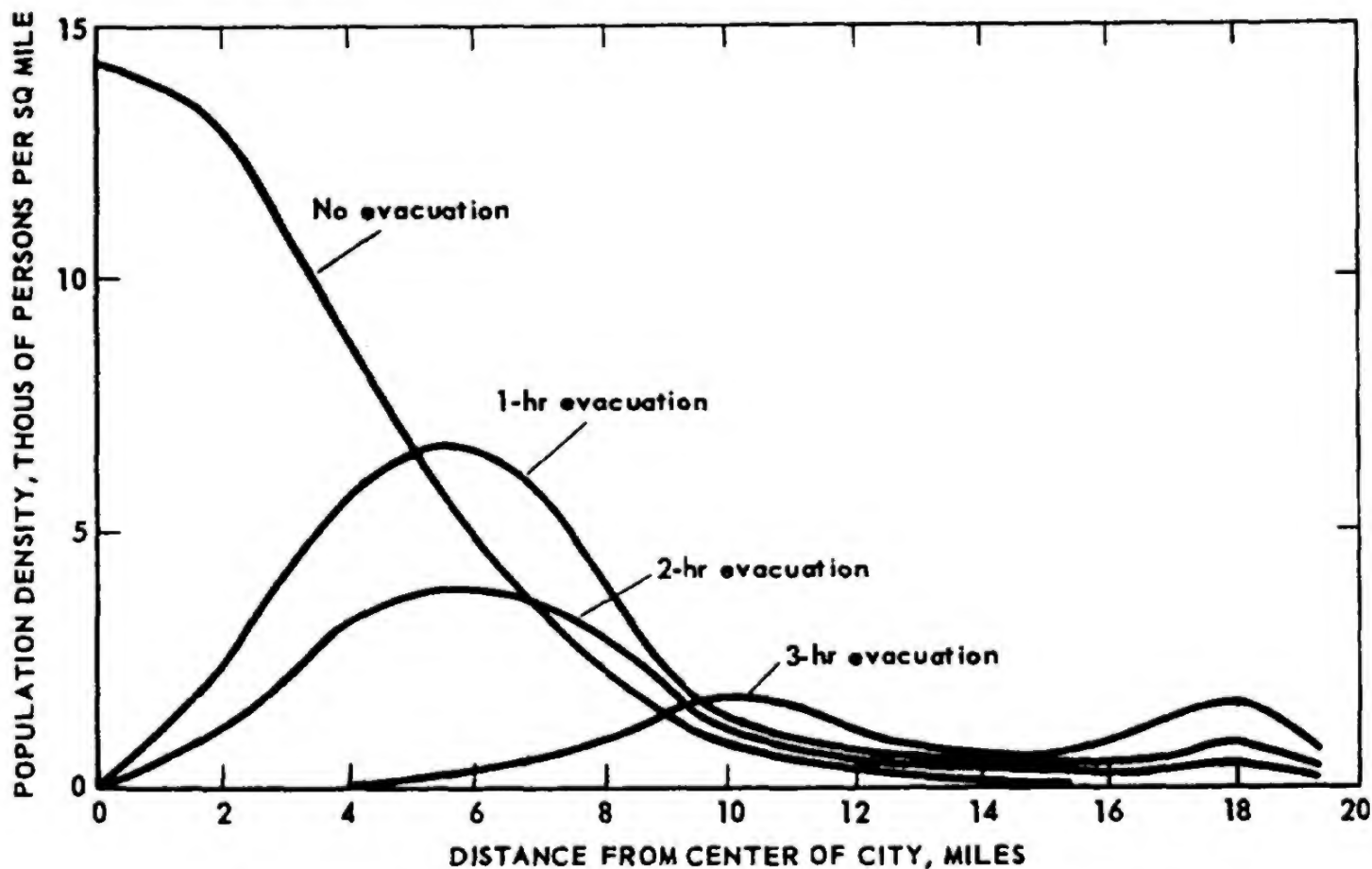
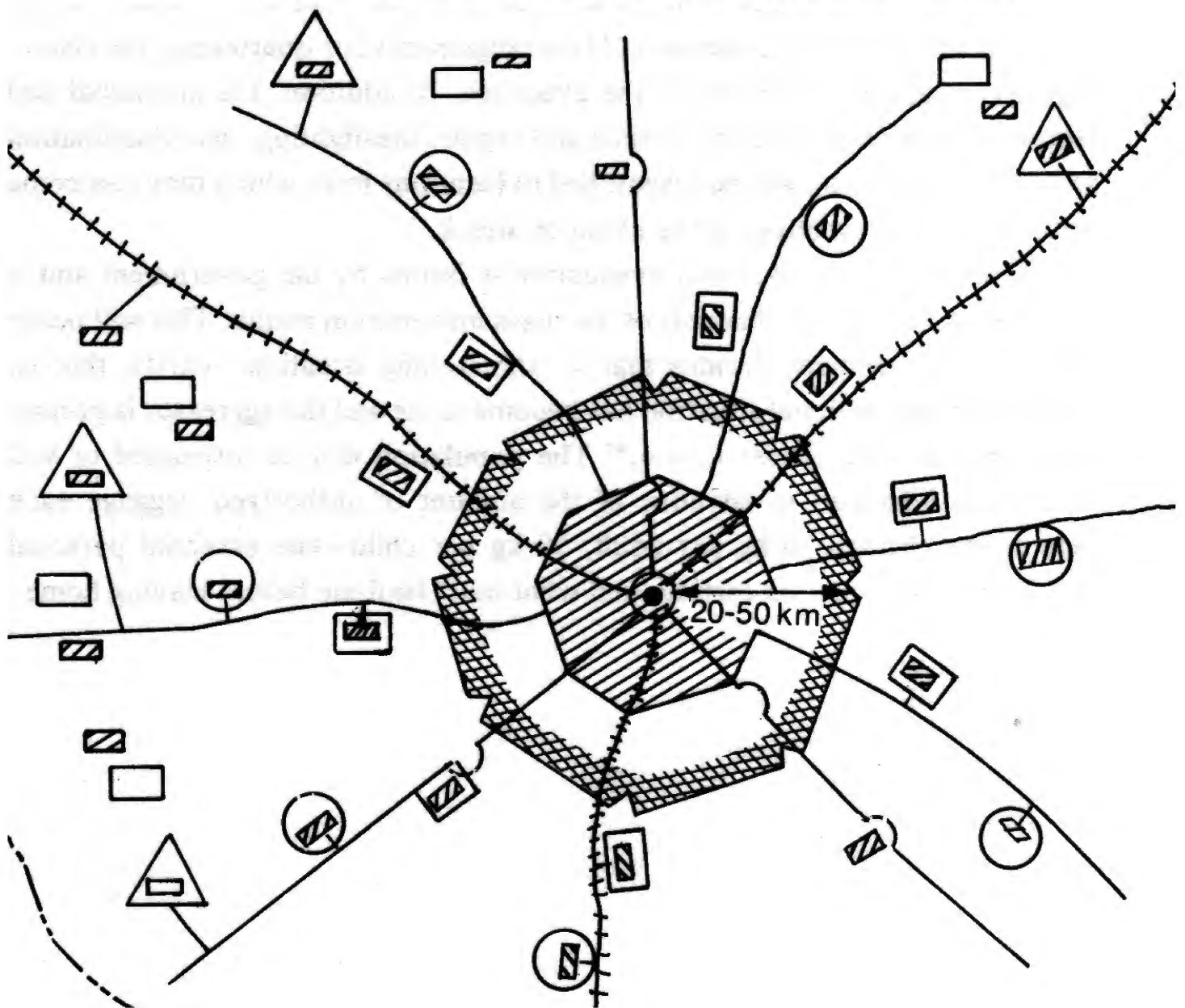


Fig. 10 — Population Density of Washington Target as Function of Distance from Center of City for Three Evacuation Times



CHART 4—Schematic Diagram of the Relocation of Dispersed Workers and Evacuated Persons and Plants.



FOR EXTERNAL PUBLICATION

Radio Moscow in Mandarin to China, Nov. 3, 1978.

"However, the fact is that China's digging deep tunnels can never protect the Chinese masses from nuclear bombing or even protect them from conventional heavy bombs."

* * * * *

Radio Moscow World Service in English, Nov. 16, 1978

"The U.S. Administration is going to launch a 5-year program of civil defense. - - - The only real safety for the Americans is strengthening friendship with the Soviet Union, not bomb shelters."

FOR INTERNAL PUBLICATION

Moscow Voyennyye Znaniya in Russian No. 5, May 1978, p. 33.

"It is appropriate to say that we still meet people who have an incorrect idea about defense possibilities. The significant increase in the devastating force of nuclear weapons compared with conventional means of attack makes some people feel that death is inevitable for all who are in the strike area. However, there is not and can never be a weapon from which there is no defense. With knowledge and the skillful use of contemporary procedures, each person can not only preserve his own life but can also actively work at his enterprise or institution. The only person who suffers is the one who neglects his civil defense studies."

Robert Scheer

WITH ENOUGH SHOVELS: Reagan, Bush & Nuclear War

“Dig a hole, cover it with a couple of doors and then throw three feet of dirt on top... It’s the dirt that does it... if there are enough shovels to go around, everybody’s going to make it.”

**—T.K. Jones, Deputy Under Secretary of Defense
for Strategic and Theater Nuclear Forces**

“President Ronald Reagan had been in office less than a year when he approved a secret plan for the United States to prevail in a protracted nuclear war. This secret plan, outlined in a so-called National Security Decision Document, committed the United States for the first time to the idea that a global nuclear war can be won.”

With these words Robert Scheer, the distinguished national reporter for the *Los Angeles Times*, begins this astonishing revelation of how a handful of Cold War ideologues—led by the President himself—have reversed the longstanding American assumption that nuclear war means mutual suicide.

Robert Scheer’s aim in *With Enough Shovels* is to expose the deadly course on which we are now embarked, a course that categorically rejects the strategic assumptions that prevailed from Presidents Eisenhower through Carter and that sustained the Nixon-Kissinger program of détente—a program which our current leaders call “appeasement.”

Leon Gouré

WAR SURVIVAL IN SOVIET STRATEGY



**With a Foreword by
AMBASSADOR FOY D. KOHLER**

integrated city and rural civil defense exercises. One exercise of this type occurred in 1975 at Lytkarino, a town of 40,000 people near Moscow and a probable relocation site for Muscovites. According to Soviet publications, thousands of people participated, communication and reconnaissance operations were conducted, and shelters were occupied by local workers. Another 1975 exercise, in Tul'skaya Oblast, involved the city of Kimovsk in Kimovski Rayon; this was known as an "integrated rayonal exercise." There may

LEON GOURÉ is a Professor of International Studies and Director of Soviet Studies at the Center for Advanced International Studies at the University of Miami. A graduate of New York University, Columbia University School of International Affairs and Russian Institute, and Georgetown University, he is the author of *Civil Defense in the Soviet Union*, *The Siege of Leningrad*, and *Soviet Civil Defense 1969-70*. He has also co-authored *Soviet Strategy for the Seventies: From Cold War to Peaceful Coexistence*, *The Role of Nuclear Forces in Current Soviet Strategy*, and *Soviet Penetration of Latin America* among others.

1st printing April 1976

2nd printing August 1976

Foreword

by Foy D. Kohler

Dr. Leon Gouré has devoted many years of study to Soviet civil defense and other war-survival policies and activities in the USSR. The area was one of his specialties while serving as a Senior Analyst for the RAND Corporation from 1951 to 1969, and he has continued his researches since joining the University of Miami in 1969 as Director of Soviet Studies and Professor in the Center for Advanced International Studies.

xi

As a part of our work program for this larger undertaking, the Center has held a series of special conferences wherein we have subjected our methodology and research findings to critical review by outside experts, including authoritative academic and governmental specialists on Soviet affairs and high-ranking policy-action officers from Defense, State and other agencies directly concerned with U.S.-Soviet relations.

At two of these conferences, special attention has been given to the Soviet war-survival problem: One in June 1975 included an exploration of how war-survival capabilities fit into the Soviet appraisal of the present and future "correlation of world forces." The second, held in January 1976, included a thorough examination of the implications for U.S. security interests and U.S. policy choices of what Moscow is actually doing in the war-survival area.

xii

Nearly all of the experts at our conference viewed the reasoning behind the overkill concept as "absurd." One cited as an example an article in the April 6, 1975 *Bulletin of the Atomic Scientists* in which the author argued that with its present stockpile of nuclear weapons the U.S. could destroy the world's population "twelve times over." The author's calculation was arrived at by multiplying the casualties per kiloton in Hiroshima and Nagasaki by the total number of kilotons in the U.S. nuclear arsenal and then dividing by the number of people living in the world. Such a calculation was characterized as completely misleading. Leaving aside such questions as how many U.S. weapons would survive a Soviet attack on this country and how many of the residue could be delivered on target, "it implies that means can be devised to collect the entire target population into the same density as existed in Hiroshima and Nagasaki and keep them in a completely unwarned and hence vulnerable posture. A statement of identical validity is that the world's inventory of artillery shells, small arms ammunition, or for that matter, kitchen knives or rocks can kill the human population several times over."

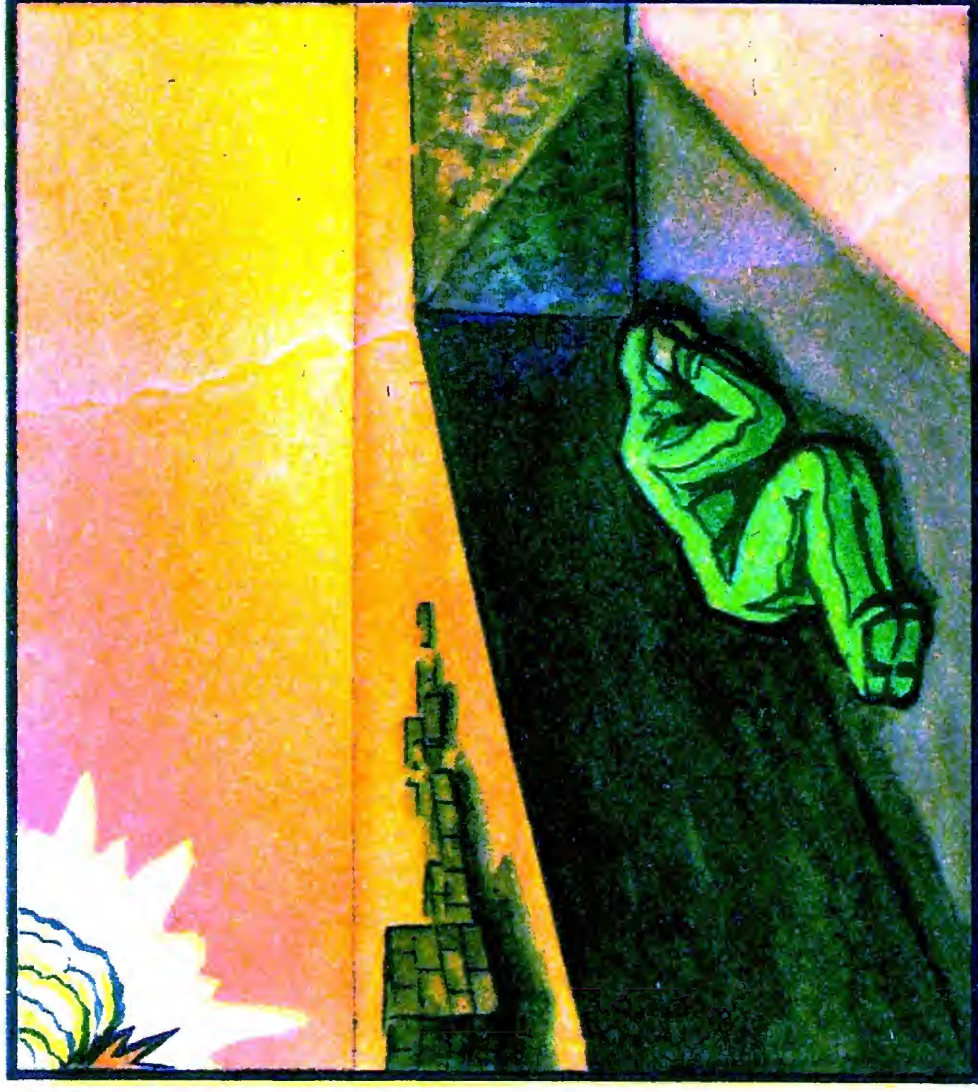
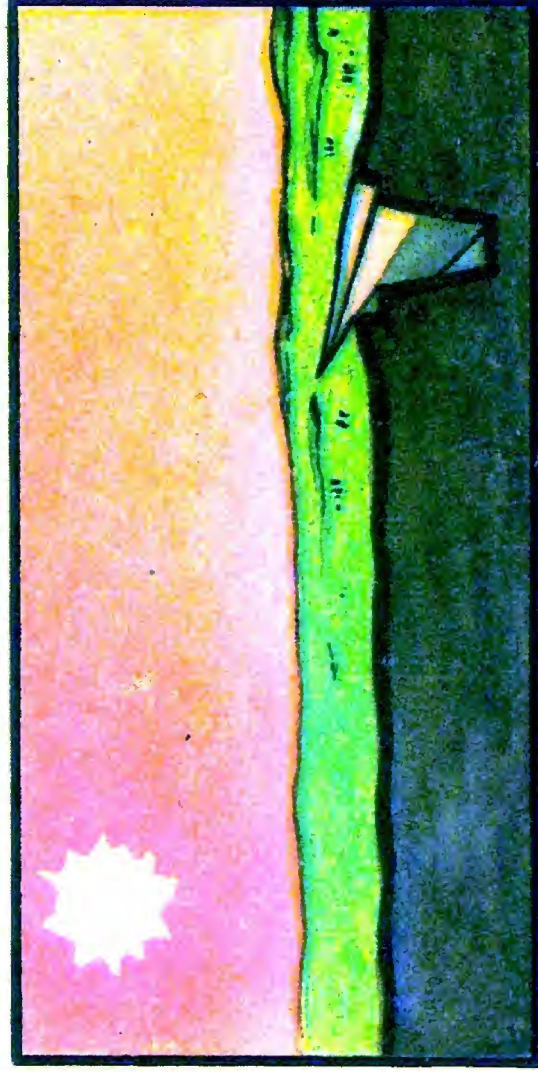
xiv

It was recalled that more than 10 billion pounds of TNT was dropped on Germany, Japan and Italy during World War II. This equalled more than 50 pounds for every man, woman and child in the three countries. Arithmetically considered, the result should have been the total annihilation of one and all of these. During the Vietnam War, more than 25 billion pounds of TNT were dumped on North and South Vietnam (15 billion by air and some 10 billion by other means) for an average of some 730 pounds for each of a total population of 34 million and an average of 3,000 pounds for each person in prime target areas; yet the U.S. was unable to kill enough people or to disrupt economic life, transportation and communications sufficiently to even avoid a humiliating defeat in the war.

xv

The basic issue, it was agreed, is how Moscow intends to exploit the situation politically. The Soviet risk calculations and ability to use its military power for political purposes are already being increasingly influenced by Moscow's perceptions of asymmetries between the U.S. and Soviet war-survival versus assured destruction capabilities. According to Moscow's view, these asymmetries are of great strategic significance for making Soviet power credible as a deterrent and as an instrument of policy. Soviet spokesmen have given clear indication of their awareness of the lack of a war-survival program in the U.S. as well as of the vulnerability of the U.S. arising from the high degree of concentration of its population and industry in a few areas of the country. It is inevitable, therefore, that the Soviet leadership will perceive this asymmetry between the Soviet Union and the U.S. as altering the balance of forces in Moscow's favor, and as affecting the credibility of the respective strategic deterrence and war-fighting postures of the two countries.

In effect, with its growing war-survival capability, the Soviet Union could well conclude that the U.S. threat of "massive retaliation" has no credibility except as an act of sheer desperation. In crisis situations, this factor could decisively influence both sides' risk calculations and consequently their relative ability and willingness to hold a hard line. The Soviet Union could confront the U.S. with its ability to keep Soviet population and resource losses within acceptable limits, all the more so if it carries out the evacuation of its cities, as against the certainty of U.S. losses of 50 percent or more of its population and of a very large portion of its industry. This would place the U.S. at a great disadvantage in the management of the crisis and in its negotiations with the Soviet Union. Instead of a "balance of terror" which equally restrains both sides, the "terror" would be mainly on the part of the U.S. and, faced with the possibility of national "suicide," the public reaction to it would be likely to deprive the President of any flexibility in his policy choices in dealing with Moscow.



Для защиты от воздействия светового излучения используют защитные сооружения и местные предметы, создающие тень

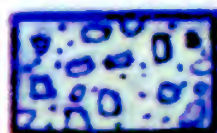
ЗАЩИТНЫЕ СВОЙСТВА МАТЕРИАЛОВ

Экспозиционную дозу радиации ослабляют вдвое материалы толщиной

сталь — 4,7 см



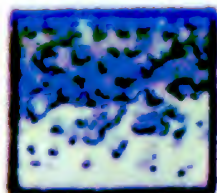
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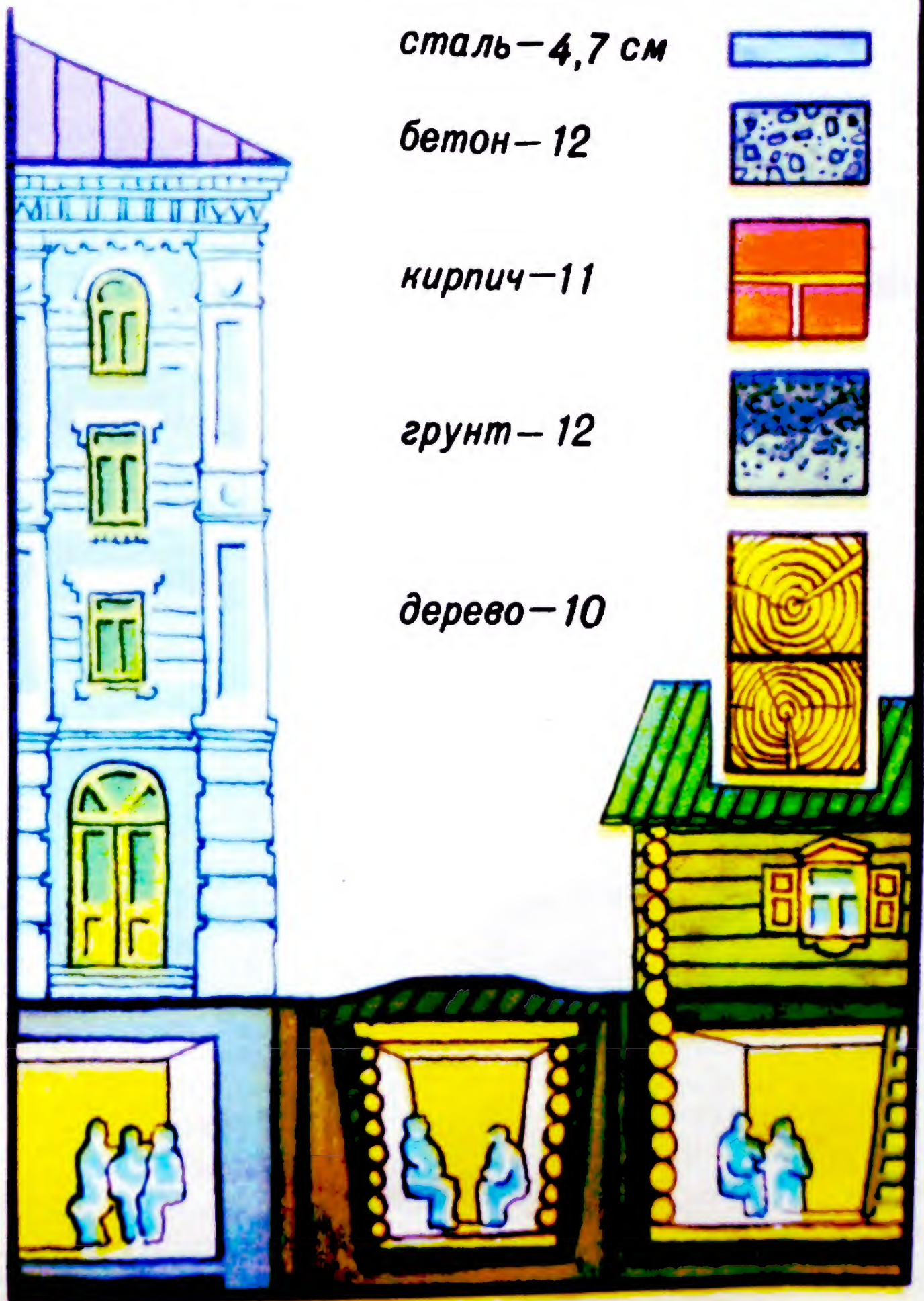
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~~Secret~~

**Interagency
Intelligence
Memorandum**

**CIA HISTORICAL REVIEW PROGRAM
RELEASE AS SANITIZED**

Soviet Civil Defense

~~Secret~~

NIO IIM 76-041
November 1976

Copy N^o 404

- *Basement*—shelters created by adapting the basement areas of residential, government, and industrial structures, primarily for protection against fallout. (See Figure 12.)
- *Subways*—shelters provided by using the subway tunnels in major Soviet cities. The degree of protection against blast varies within subways, but all afford good protection against fallout. (See Figure 13.)
- *Expedient or hasty*—shelters built with materials readily available during the period immediately prior to a nuclear attack. (See Figure 14.)

112. These several types of Soviet shelters offer varying degrees of protection against blast and fallout. According to Soviet planning, the type of shelter, its location, and the protection afforded are functions of the priority assigned to the survival of the protected

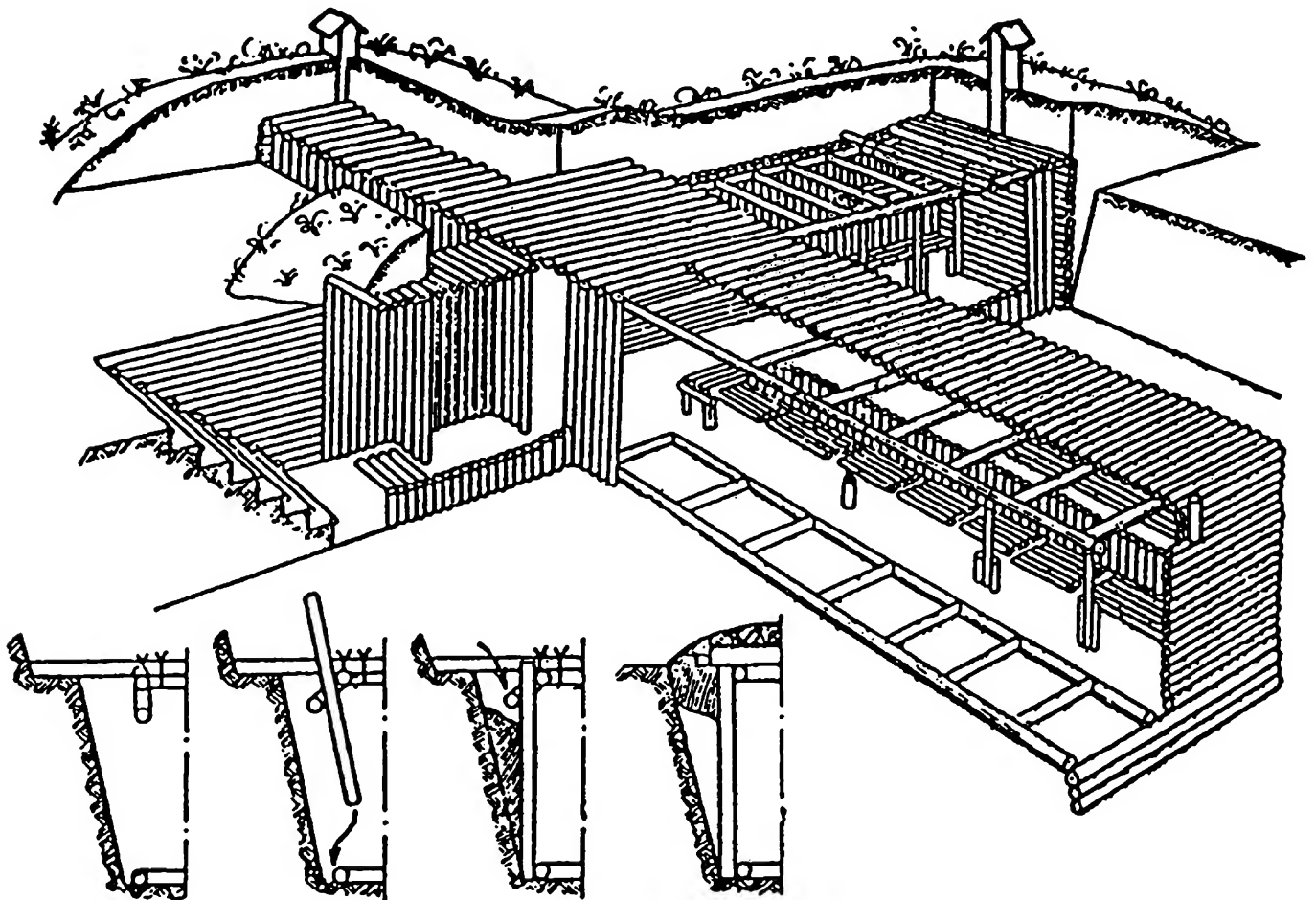
personnel, the likelihood of direct attack or proximity to a target, and the availability of suitable structures that could be adapted as shelters.

113. Detached, bunker-type shelters, adaptable and built-in basement shelters, and subways are available for the protection of both essential workers and the general population. Dual-purpose shelters are also used as underground garages, clubs, and theaters which could be converted quickly to civil defense use.

114. Soviet writings and human sources have also referred to the use of various types of expedient, or temporary, shelters for protection from fallout. They consist of trenches lined with readily available materials and covered with earth. These shelters, which are described in more detail in paragraphs 139-141, are intended primarily for use by the rural population and by the urban population at dispersal and evacuation sites in rural areas. They could also be

Figure 14. Illustration of Soviet Expedient or Hasty Shelter

Diagrams such as this are provided in manuals widely distributed to the Soviet population for use in constructing hasty shelters in dispersal and evacuation areas.



569821 6 76

[USSR, "Antiradiation shelters in rural areas", 1972.]

or evacuee. In practice, we believe—and emigrés have indicated—that conditions would be much more congested. Details on equipment and supplies for evacuees (including food, water, medicine, and fuel) are discussed later in this chapter.

134. *Time Requirements for Evacuation.* Soviet sources call for evacuation of Soviet cities within the "special period" (a period of warning) preceding an attack, and imply that the evacuation time would be about 72 hours. Soviet authorities have not published their assessment of actual time which would be required for evacuation of the nonessential population. Several US studies have addressed the speed with which the Soviets could complete their evacuation actions. A 1969 RAND study estimated that 100 million urban residents²⁷ could be evacuated in four days under optimum conditions, using only half of the

²⁷ This number of urban inhabitants equals the total population of some 450 cities with populations of 50,000 or more and includes almost all major administrative, residential, communication, and transportation centers.

available 1970 transportation capacity. A 1976 Defense Intelligence Agency study of the evacuation of 12 selected Soviet cities concluded that, under the most favorable conditions, the Soviets have a physical capability to evacuate most of the 12 cities within three to four days after movement begins. The major assumptions used in the DIA study were:

- 70 percent of population evacuated, 30 percent dispersed;
- two shifts working in essential industries and services;
- a six-hour alert preceding actual movements (this period of alert has been tested in Soviet exercises); and
- no other complications, such as panic, severe disruption of transport systems, or adverse weather conditions.

Figures 18, 19, and 20 and Table V summarize the findings of the DIA dispersal and evacuation study.

TABLE V

DIA-Estimated Time Required for Evacuation
of Twelve Selected Soviet Cities

City	Numbers evacuated (thousands) ¹	Maximum distance		Estimated time required after movement begins (hours) ²	Modes of transport
		(km)	(nm)		
Leningrad	2,673	³		117+	mostly rail, some maritime
Kiev	1,407	110	60	36	rail and highway
Tashkent	1,158	260	140	81	rail
Gor'kiy	914	315	170	75	rail and highway
Odessa	718	⁴		58	mostly rail, some maritime
Dnepropetrovsk	684	185	100	57	rail
Khabarovsk	351	410 ⁵	220 ⁵	56	rail
Orenburg	288	185	100	47	rail
Kishinev	331	75	40	39	rail and highway
Sevastopol'	187	165	90	29	highway
Angarsk	164	410 ⁵	220 ⁵	42	rail
Kirovabad	141	95	50	25	rail

¹ Represents 70 percent of city's inhabitants.

² Movement begins six hours after the alert. Methodology utilized in calculating evacuation times considers variables such as running speeds, loading and unloading rates, and sequences of unloading dictated by availability of facilities. Since these variables are not known quantities but judgments based on available evidence, the resulting figures for total evacuation time are approximate rather than exact values.

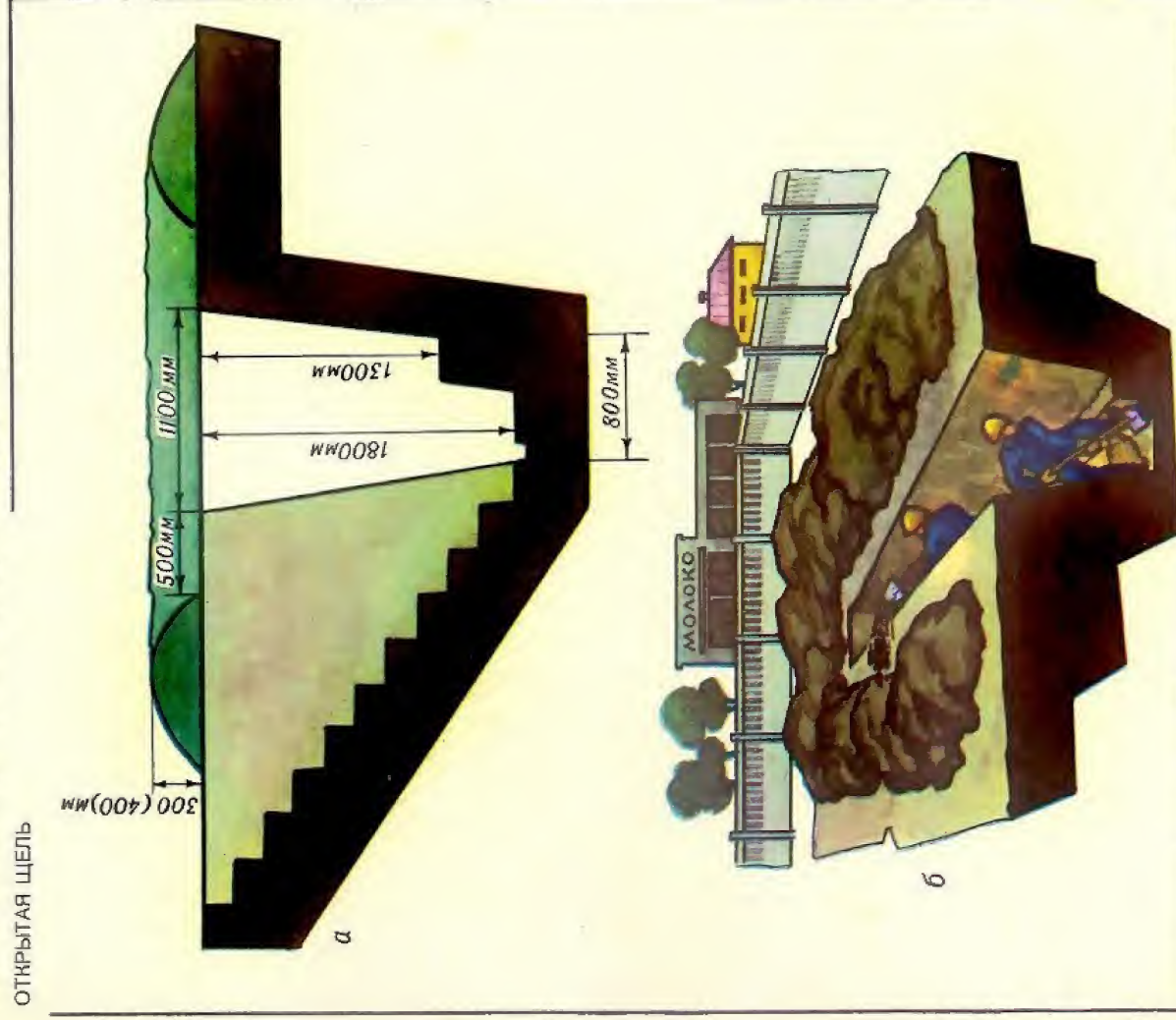
³ Leningrad can accommodate some 90 large oceangoing ships which could offload evacuees at various ports along the Baltic coast, but a cycle time of three to four days is estimated before ships can return for more evacuees.

⁴ Odessa, which can handle some 38 oceangoing ships, could offload evacuees in Romania and Bulgaria, but the cycle time for return of ships is four or more days.

⁵ Distances for Khabarovsk and Angarsk are greater than for larger cities because of low population density in surrounding areas.

ПРОСТЕЙШИЕ УКРЫТИЯ ОСЛАБЛЯЮТ ВОЗДЕЙСТВИЕ УДАРНОЙ ВОЛНЫ И РАДИОАКТИВНОГО ИЗЛУЧЕНИЯ, ЗАЩИЩАЮТ ОТ СВЕТОВОГО ИЗЛУЧЕНИЯ И ОБЛОМКОВ РАЗРУШАЮЩИХСЯ ЗДАНИЙ; ПРЕДОХРАНЯЮТ ОТ ПО-

ОТКРЫТАЯ ЩЕЛЬ

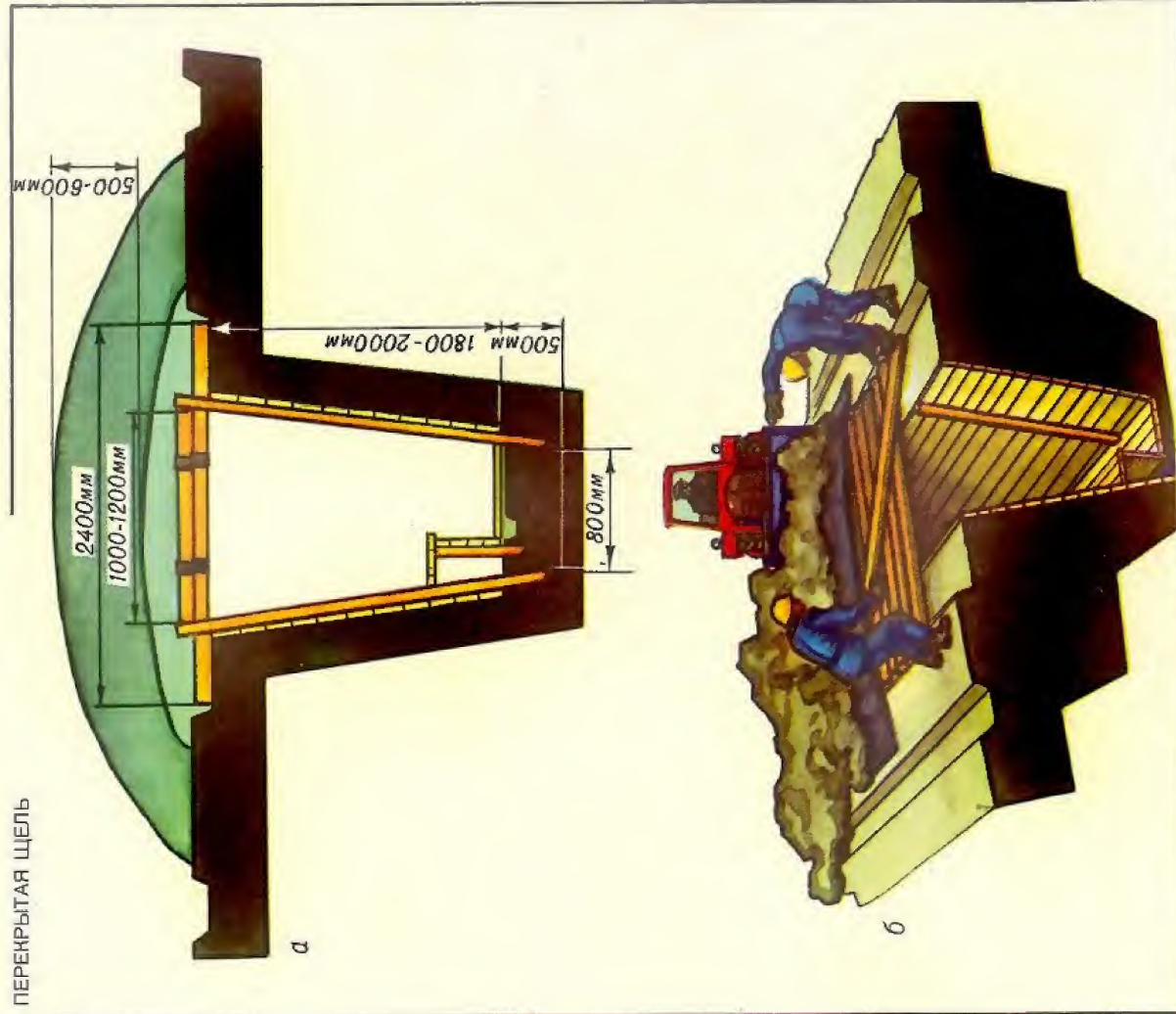


а) схема щели; б) отрывка щели

ПРИ УГРОЗЕ НАПАДЕНИЯ ПРОТИВНИКА НАСЕЛЕНИЕ МОЖЕТ СВОИМИ СИЛАМИ СООРУЖАТЬ ИЗ ПОДРУЧНЫХ МАТЕРИАЛОВ ПРОСТЕЙШИЕ УКРЫТИЯ ТИПА ОТКРЫТЫХ, ПЕРЕКРЫТЫХ ЩЕЛЕЙ И ДР.

ПАДАНИЯ НА ОДЕЖДУ И КОЖУ РАДИОАКТИВНЫХ, ОТРАВЛЯЮЩИХ И ЗАЖИГАТЕЛЬНЫХ ВЕЩЕСТВ

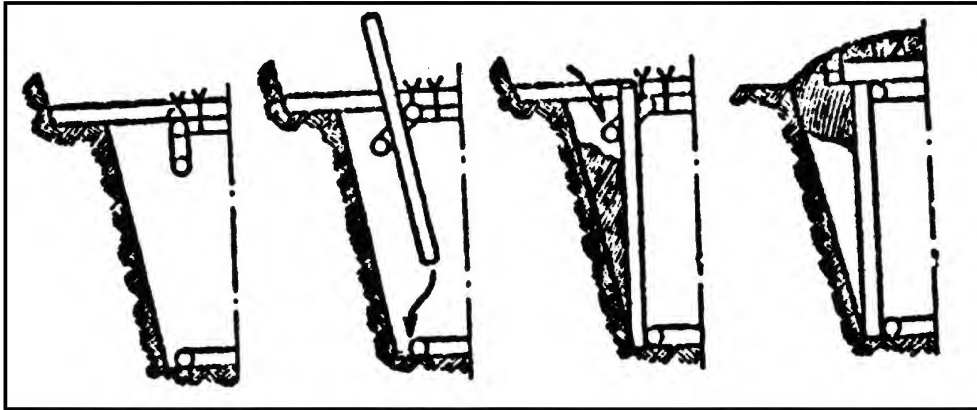
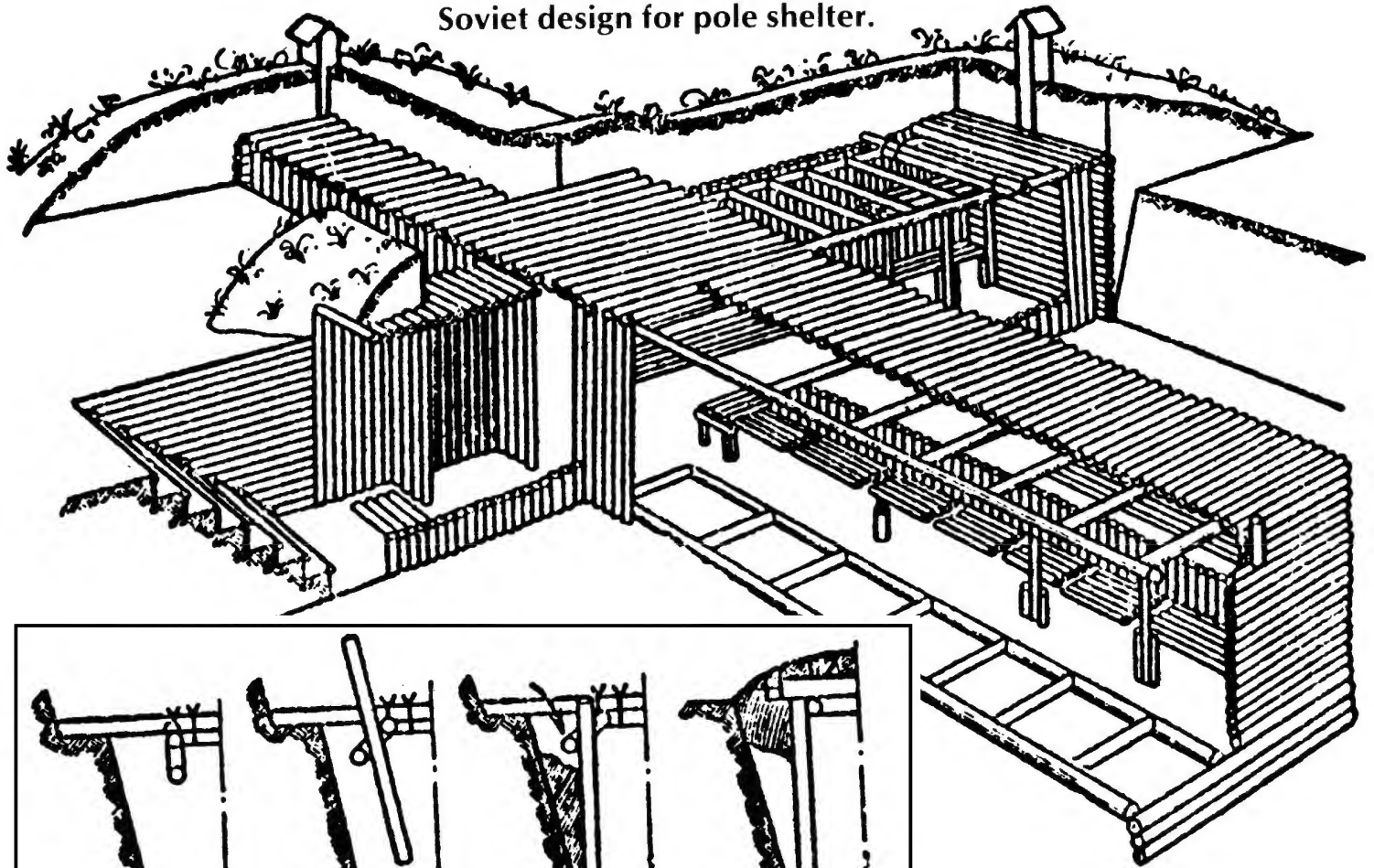
ПЕРЕКРЫТАЯ ЩЕЛЬ



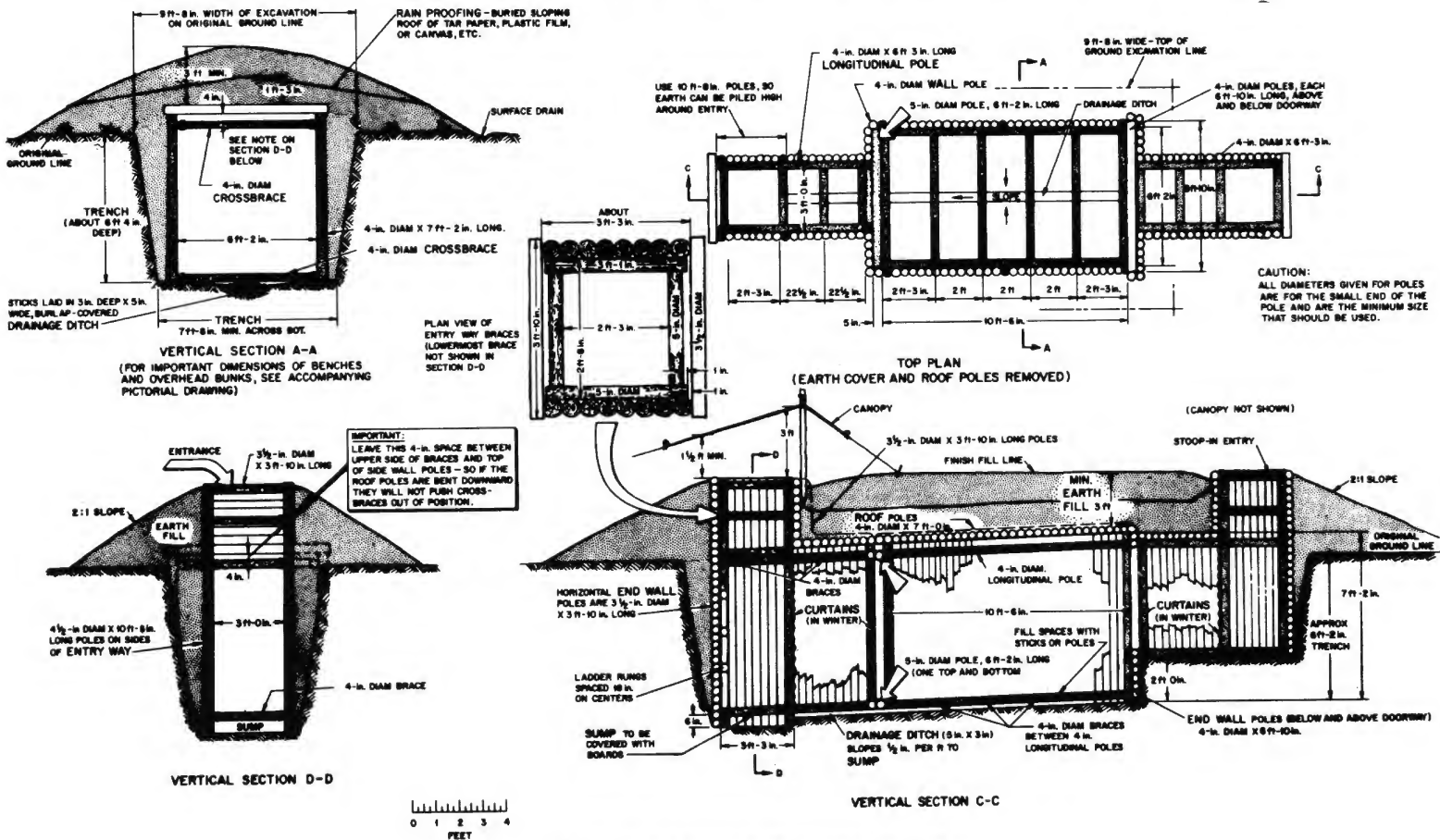
а) схема щели; б) сооружение перекрытой щели с одеждой кругостей

ПРИ УГРОЗЕ НАПАДЕНИЯ ПРОТИВНИКА НАСЕЛЕНИЕ МОЖЕТ СВОИМИ СИЛАМИ СООРУЖАТЬ ИЗ ПОДРУЧНЫХ МАТЕРИАЛОВ ПРОСТЕЙШИЕ УКРЫТИЯ ТИПА ОТКРЫТЫХ, ПЕРЕКРЫТЫХ ЩЕЛЕЙ И ДР.

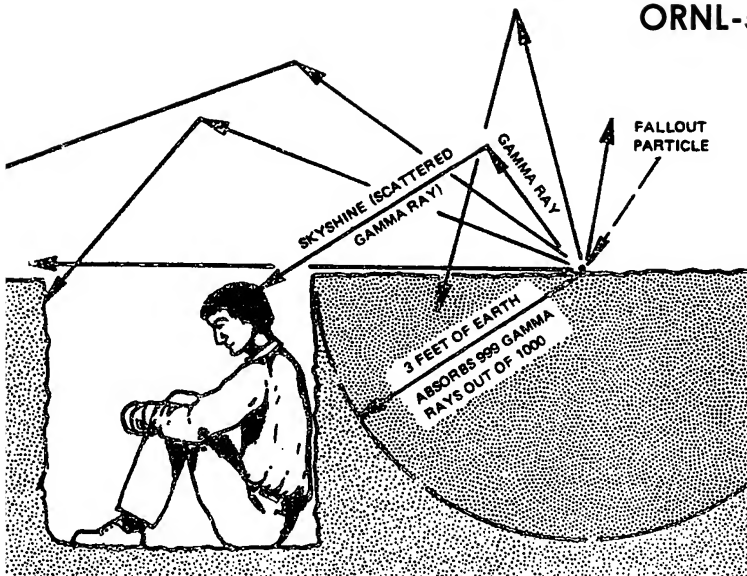
Soviet design for pole shelter.



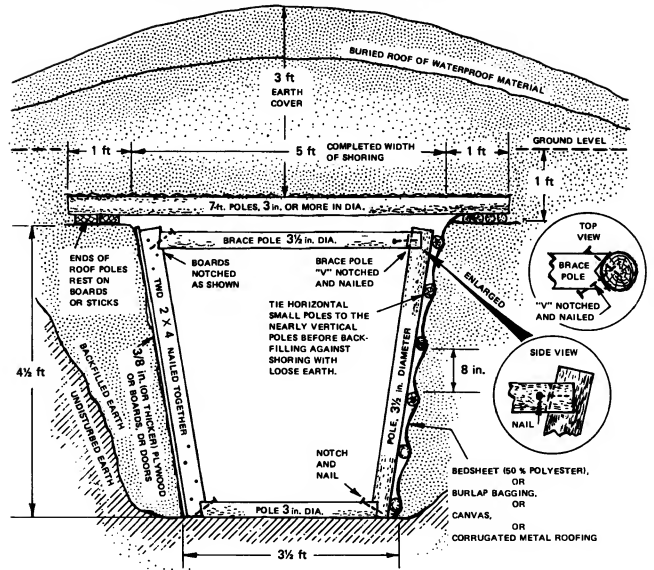
Soviet design for pole shelter adapted for American use



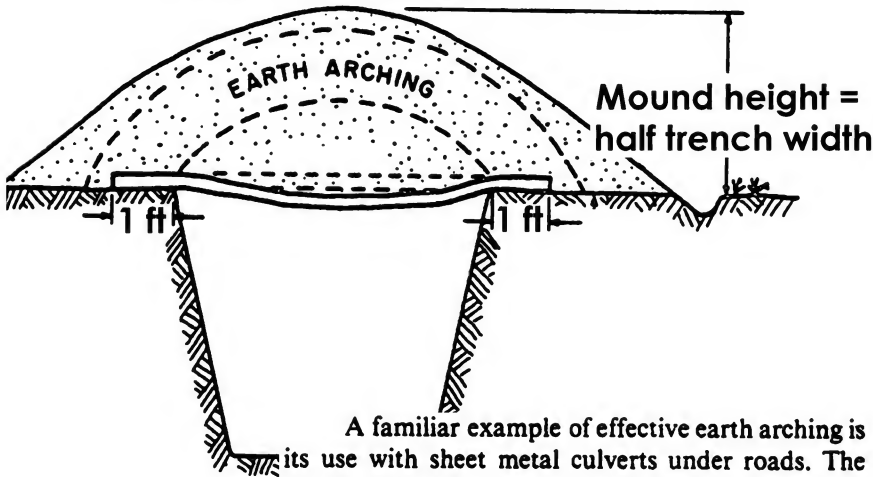
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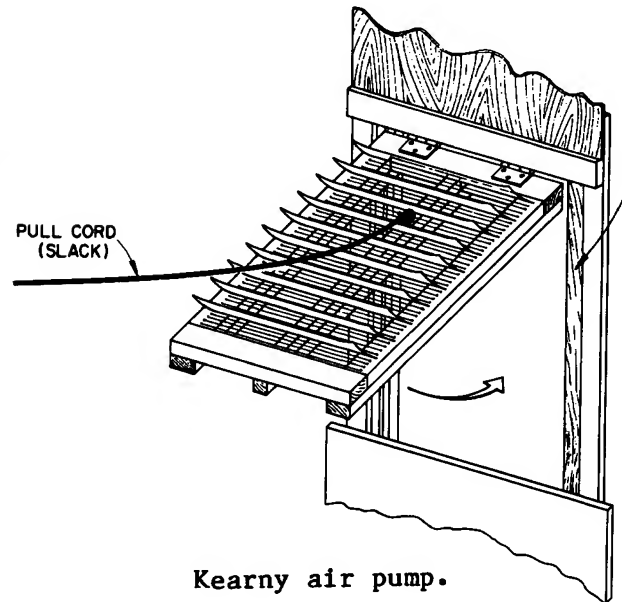
Methods for shoring a trench shelter.



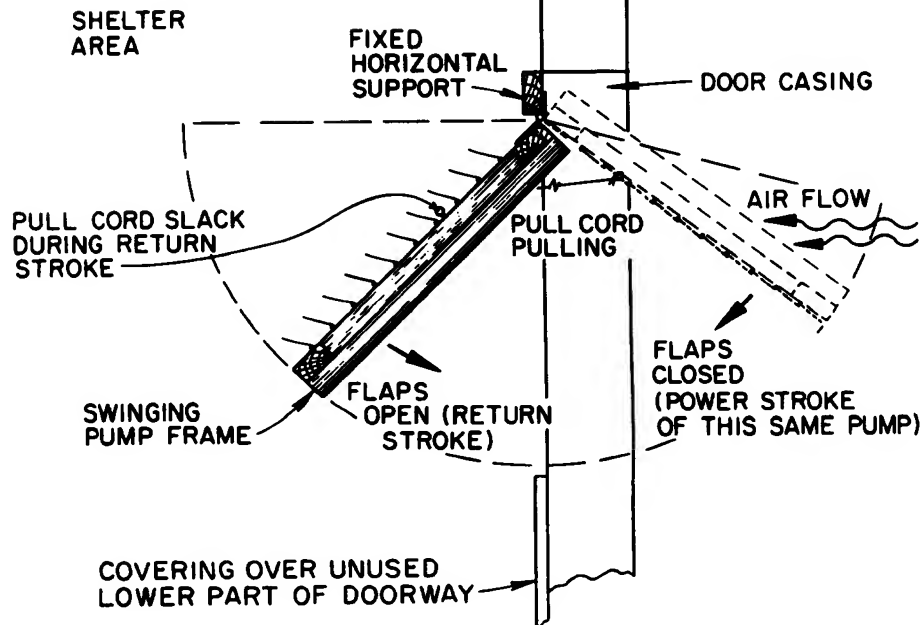
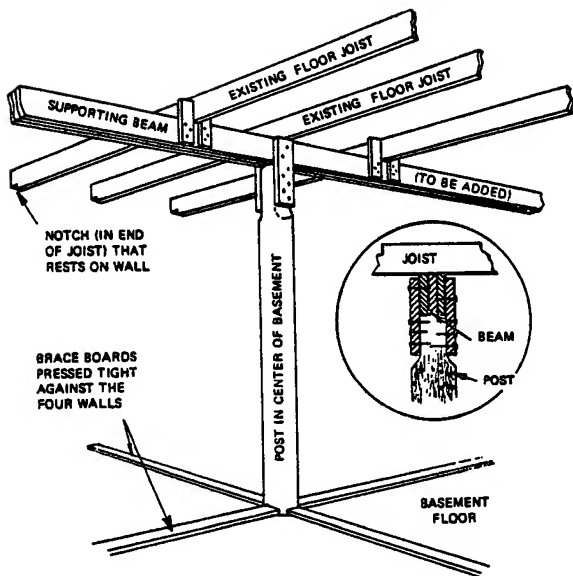
EARTH ARCHING USED TO STRENGTHEN SHELTERS



A familiar example of effective earth arching is its use with sheet metal culverts under roads. The arching in a few feet of earth over a thin-walled culvert prevents it from being crushed by the weight of heavy vehicles.

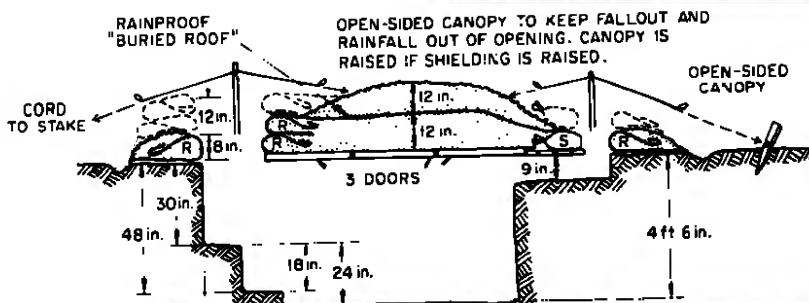
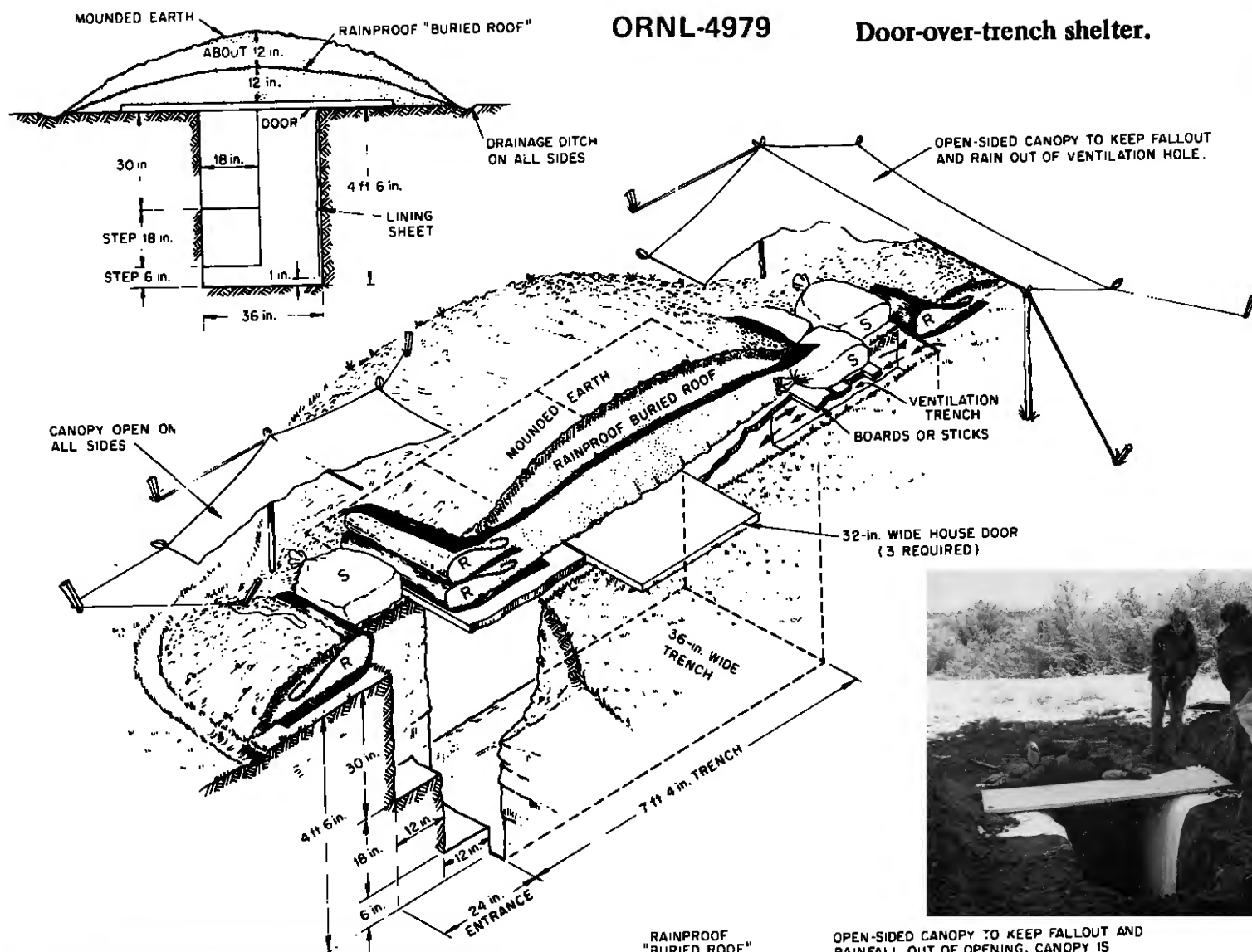


Kearny air pump.



ORNL-4979

Door-over-trench shelter.



Survival of Food Crops and Livestock in the Event of Nuclear War

Proceedings of a symposium held at
Brookhaven National Laboratory
Upton, Long Island, New York
September 15–18, 1970

Sponsored by
Office of Civil Defense
U. S. Atomic Energy Commission
U. S. Department of Agriculture

Editors

David W. Bensen
Office of Civil Defense
Arnold H. Sparrow
Brookhaven National Laboratory

December 1971

THE SIGNIFICANCE OF LONG-LIVED NUCLIDES AFTER A NUCLEAR WAR

R. SCOTT RUSSELL, B. O. BARTLETT, and R. S. BRUCE

Agricultural Research Council, Letcombe Laboratory, Wantage, Berkshire, England

ABSTRACT

The radiation doses from the long-lived nuclides ^{90}Sr and ^{137}Cs , to which the surviving population might be exposed after a nuclear war, are considered using a new evaluation of the transfer of ^{90}Sr into food chains.

As an example, it is estimated that, in an area where the initial deposit of near-in fallout delivered 100 R/hr at 1 hr and there was subsequent worldwide fallout from 5000 Mt of fission, the dose commitment would be about 2 rads to the bone marrow of the population and 1 rad to the whole body. Worldwide fallout would be responsible for the major part of these doses.

It is now widely recognized that long-lived fission products would make a negligible contribution to the radiation exposure of the population in heavily contaminated areas shortly after a nuclear attack. The external radiation dose would usually be dominant, and, if simple precautions were taken to avoid the superficial contamination of foodstuffs, the entry of ^{131}I into milk would cause the only important problem of dietary contamination. Thus, for example, infants probably would not receive doses of more than 0.1 rad to bone marrow from ^{90}Sr nor more than 0.01 rad from ^{137}Cs in the weeks after a nuclear attack if they were fed continuously with milk produced in an area where the external dose rate at 1 hr after detonation had been 100 R/hr. Doses to the thyroid from ^{131}I might, however, exceed 200 rads.

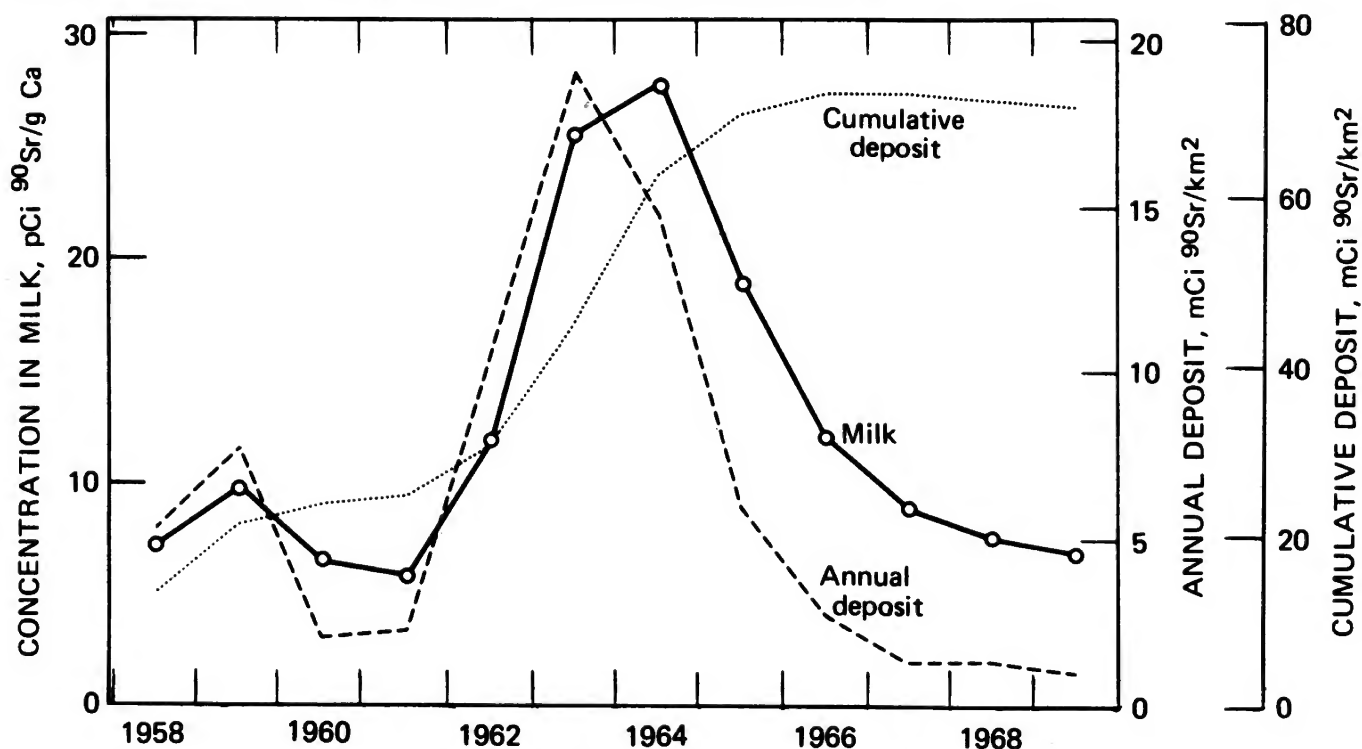


Fig. 1 Strontium-90 in fallout and milk in the United Kingdom, 1958 to 1969.

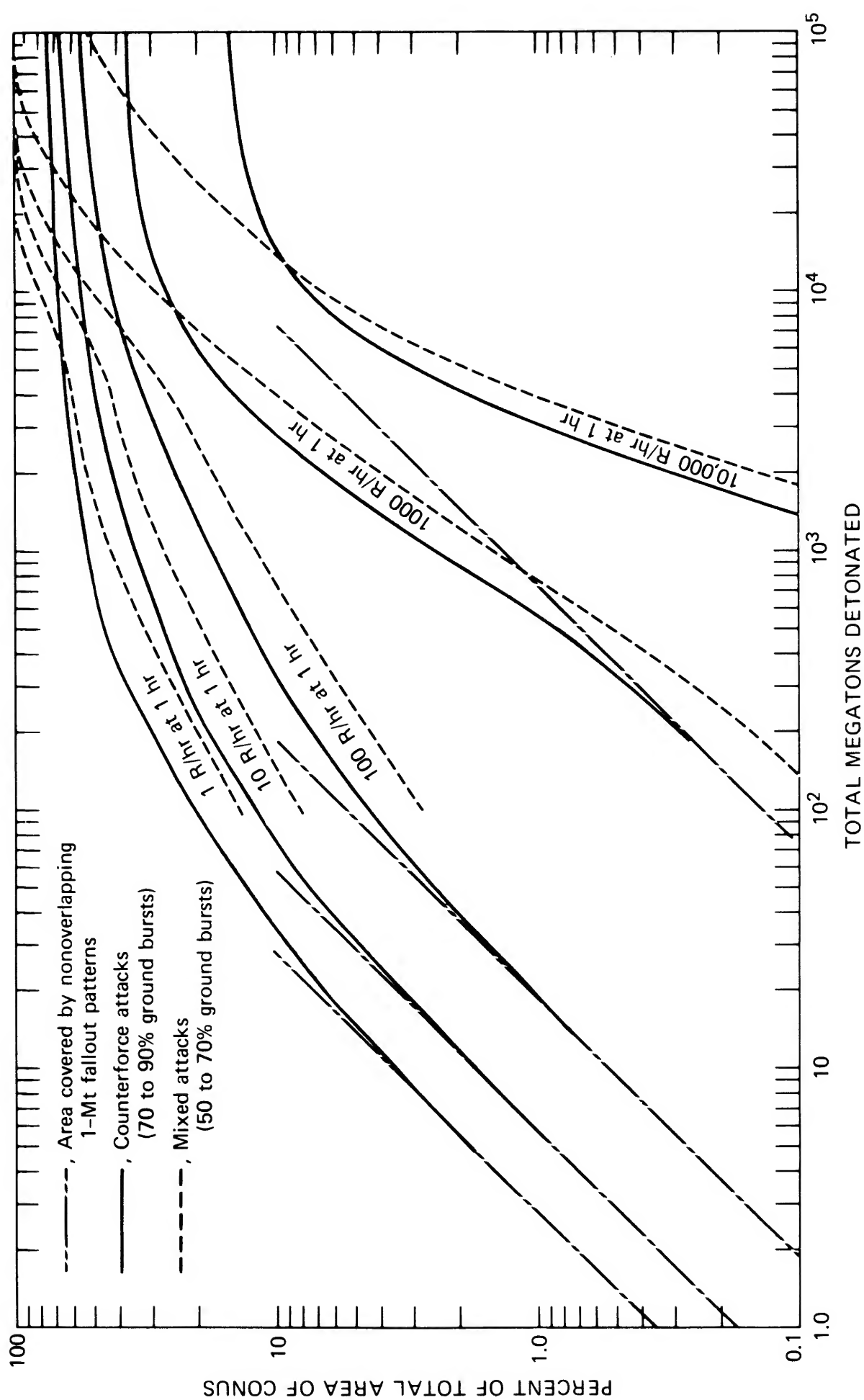
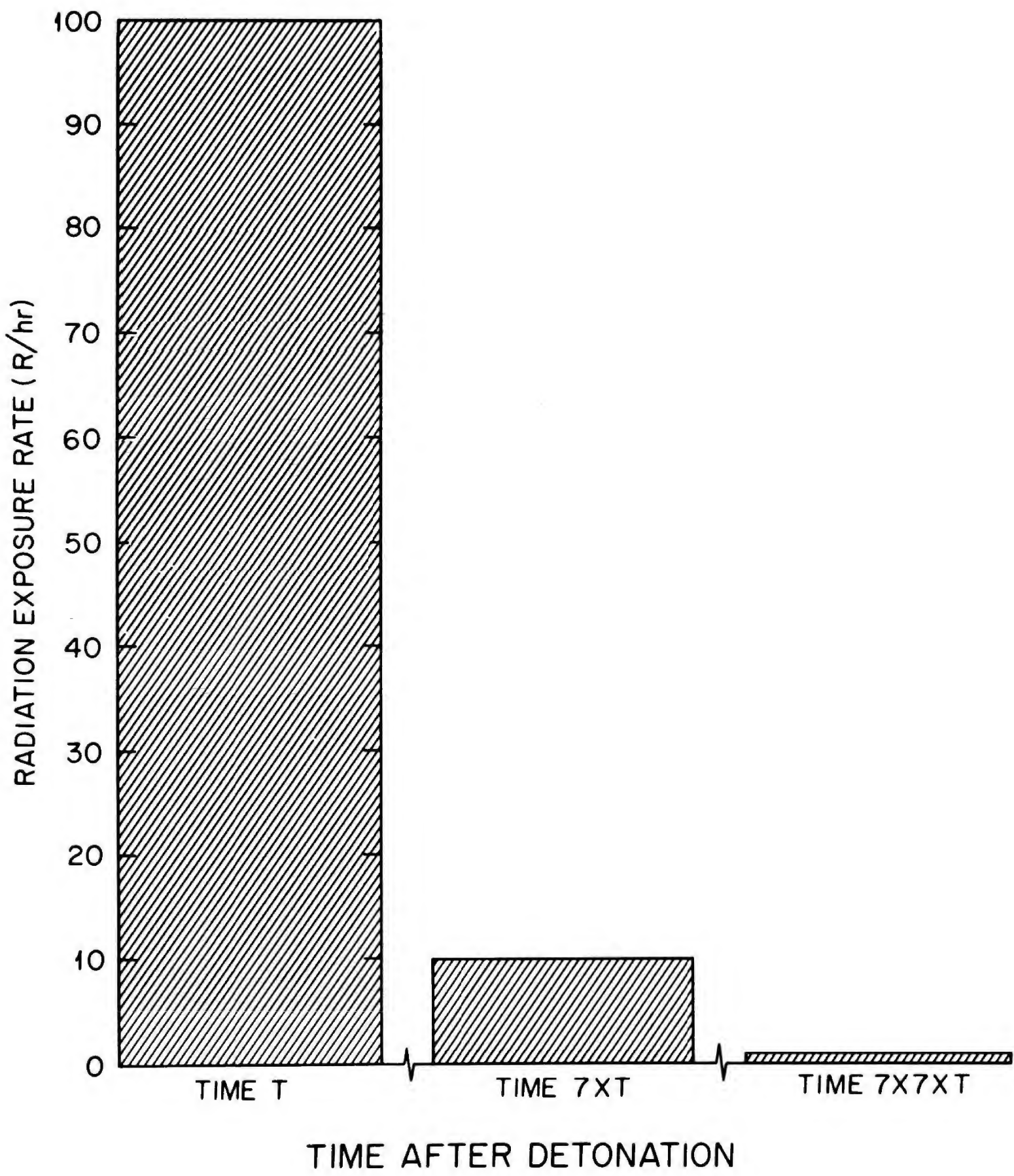
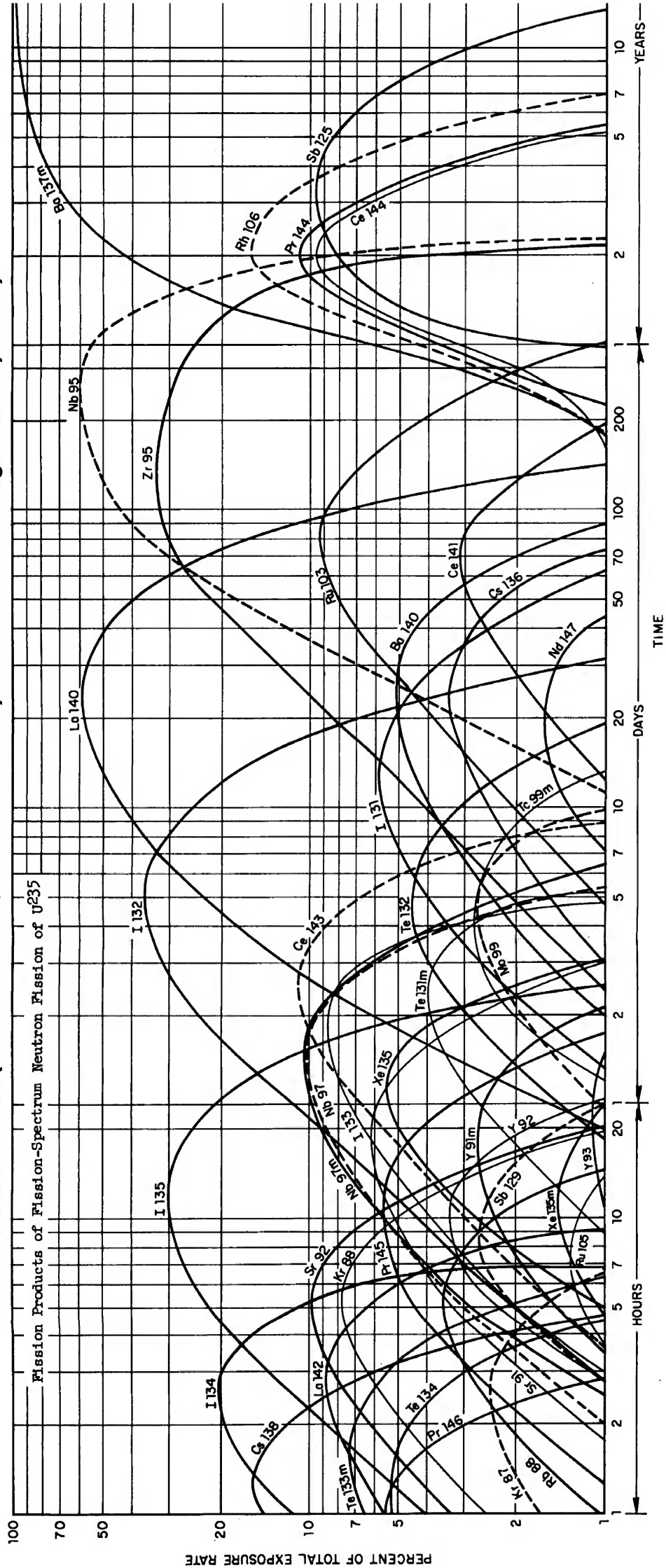


Fig. 1 Percent of area of the continental United States enclosed within selected I_s contours as a function of attack weight (50% fission weapons).

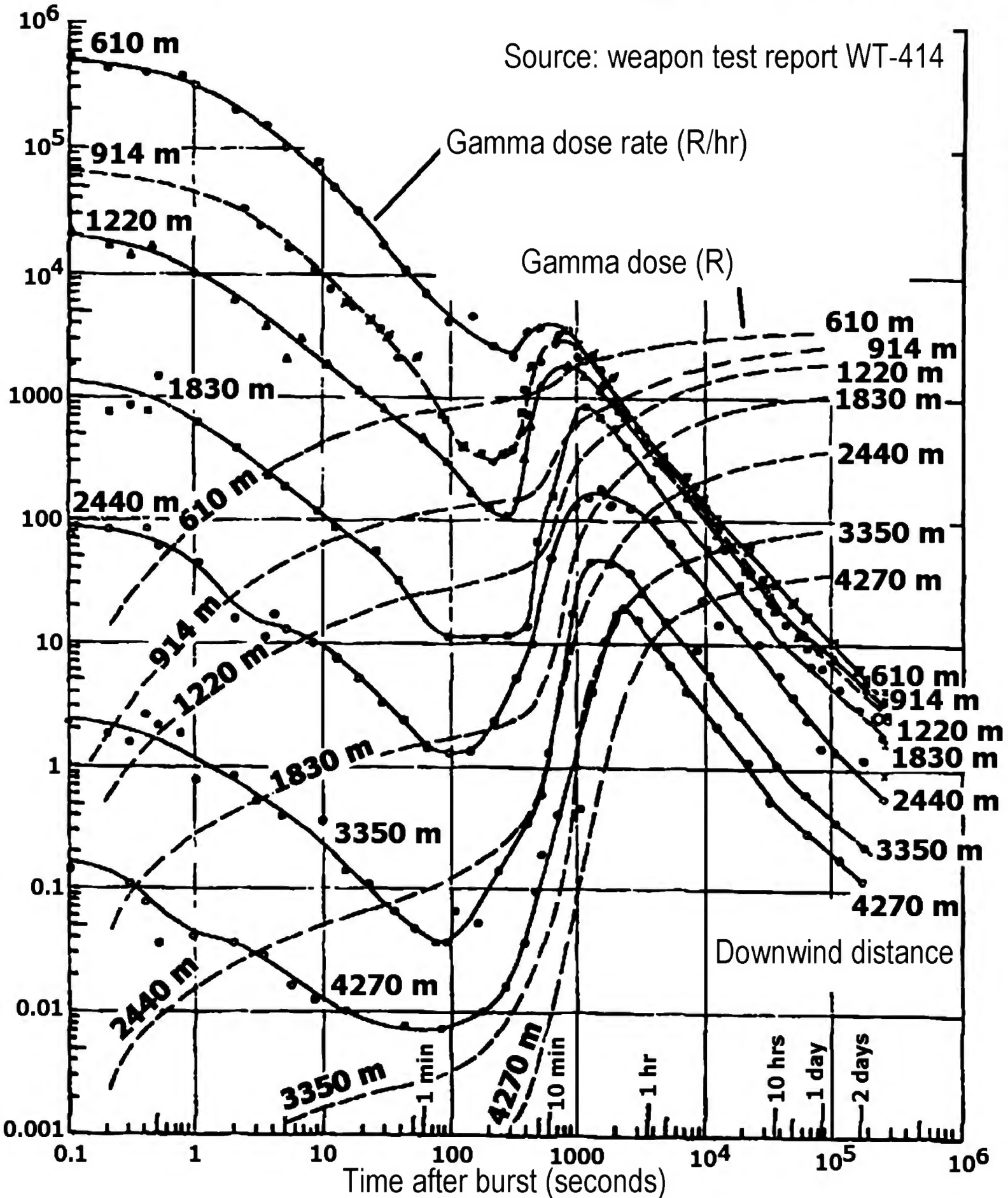


Source: USNRDL-TR-1009 (curves for Pu-239, U-233 and U-238 by different neutron energies are very similar)

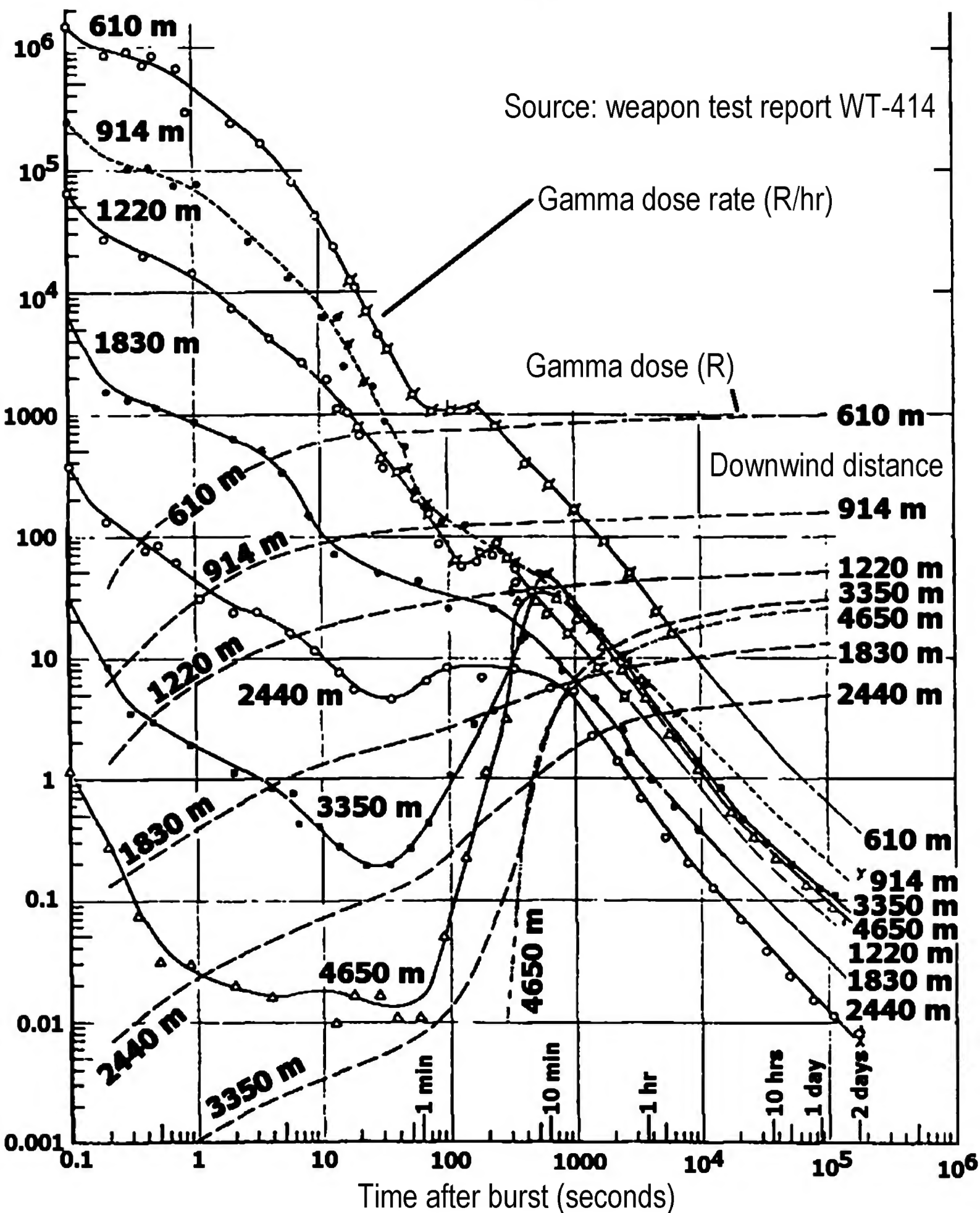


1.2 kt UNCLE test (5.2 m underground, Nevada)

Source: weapon test report WT-414



1.2 kt SUGAR test (Nevada surface burst)



SECRET

Security Information

WT-393

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AD482985

Operation

JANGLE

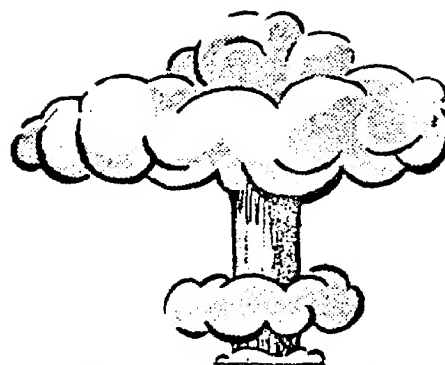
NEVADA PROVING GROUNDS
OCTOBER-NOVEMBER 1951

Project 2.3-2

FOXHOLE SHIELDING OF GAMMA RADIATION

EACH TRANSMITTAL OF THIS DOCUMENT OUTSIDE
THE AGENCIES OF THE U.S. GOVERNMENT MUST
HAVE PRIOR APPROVAL OF THE DIRECTOR,
DEFENSE ATOMIC SUPPORT AGENCY, WASHINGTON,
D.C. 20301.

RESTRICTED DATA
ATOMIC ENERGY ACT 1946



ARMED FORCES SPECIAL WEAPONS PROJECT
WASHINGTON D.C.

UNCLASSIFIED

SECRET

Security Information

PROJECT 2.3-2

TABLE 3.1

Distribution of Gamma Radiation in Foxholes (Surface Burst)

Range (ft)	Location	Two-man Foxhole			One-man Foxhole		Soil Pipe
2000	36" Above Surface	800 r					
	Surface	700					
	16" Below Surface	230	205	415			
	32" Below Surface	24	58	136			
	48" Below Surface	12.8	22	62			
2500	36" Above Surface	230 r					
	Surface	220					
	16" Below Surface	35	60	85			
	32" Below Surface	7	15	26			
	48" Below Surface	4	8.5	13.3			
3000	36" Above Surface	110 r					73 r
	Surface	90			55		
	16" Below Surface	23	36	55	6.8	6.6	10
	32" Below Surface	7.6	12.4	19.4	2.5	2.4	0.5
	48" Below Surface	2.5	4.8	6.7	1.6	1	0
3500	36" Above Surface	41 r					
	Surface	---					
	16" Below Surface	3	---	9.7			
	32" Below Surface	1.6	2.8	3.4			
	48" Below Surface	.54	.99	1.9			
4000	36" Above Surface	17 r					17 r
	Surface	9.6			---		
	16" Below Surface	1.6	3	5.6	---	0.35	---
	32" Below Surface	0.6	1.12	1.62	---	---	0.17
	48" Below Surface	---	0.54	0.57	0.39	---	---
4500	36" Above Surface	9.8 r					
	Surface	4.6					
	16" Below Surface	1	1.8	3.5			
	32" Below Surface	0.5	0.7	1.04			
	48" Below Surface	0.21	0.4	0.57			
5000	36" Above Surface	4.8 r					
	Surface	2.7					
	16" Below Surface	0.6	0.99	2.95			
	32" Below Surface	0.3	0.5	0.75			
	48" Below Surface	0.17	0.2	0.38			

CONCLUSIONS5.1 FOXHOLE SHIELDING OF GAMMA RADIATION5.1.1 Surface Detonation

Standard foxholes provide excellent protection to personnel from the gamma radiation emitted during the detonation of an atomic weapon on the surface of the ground. The results from the comparatively small sized weapon employed in Operation JANGLE show that 2000 feet from the burst, the location of the closest foxhole doses of about 60r were measured at the bottom of a foxhole, less than 10 per cent of the dose measured 3 feet above the surface of the ground. Due to the location of the foxhole in the crosswind direction, the dose at the bottom was caused primarily by scattered prompt radiation plus a small contribution from the residual activity of the fission products on the surface of the ground. In the downwind direction there would be a contribution from matter that falls out from the cloud into the foxhole in addition to the above mentioned. This fall-out will depend on the wind velocity for a given sized weapon, and although it is expected to increase the dose in the foxholes, especially in those located close to the detonation, it is relatively unimportant in comparison to the prompt and residual activity since it can be easily shoveled out of the foxhole in a short time.

5.1.2 Underground Detonation

With the possible exception of those located in the area close to the point of detonation where extensive fall-out occurs, foxholes also provide effective shielding in the case of an underground detonation. Even within this area of extensive fall-out, which at Operation JANGLE extended approximately 2000 feet, the high doses recorded in the foxholes could be greatly reduced by digging out the radioactive matter that fell into the hole. It is highly probable that one-half the doses recorded in the foxholes located within 2500 feet of the detonation at Operation JANGLE were directly attributable to this type of fall-out and most likely a higher percentage at distances greater than 2500 feet.

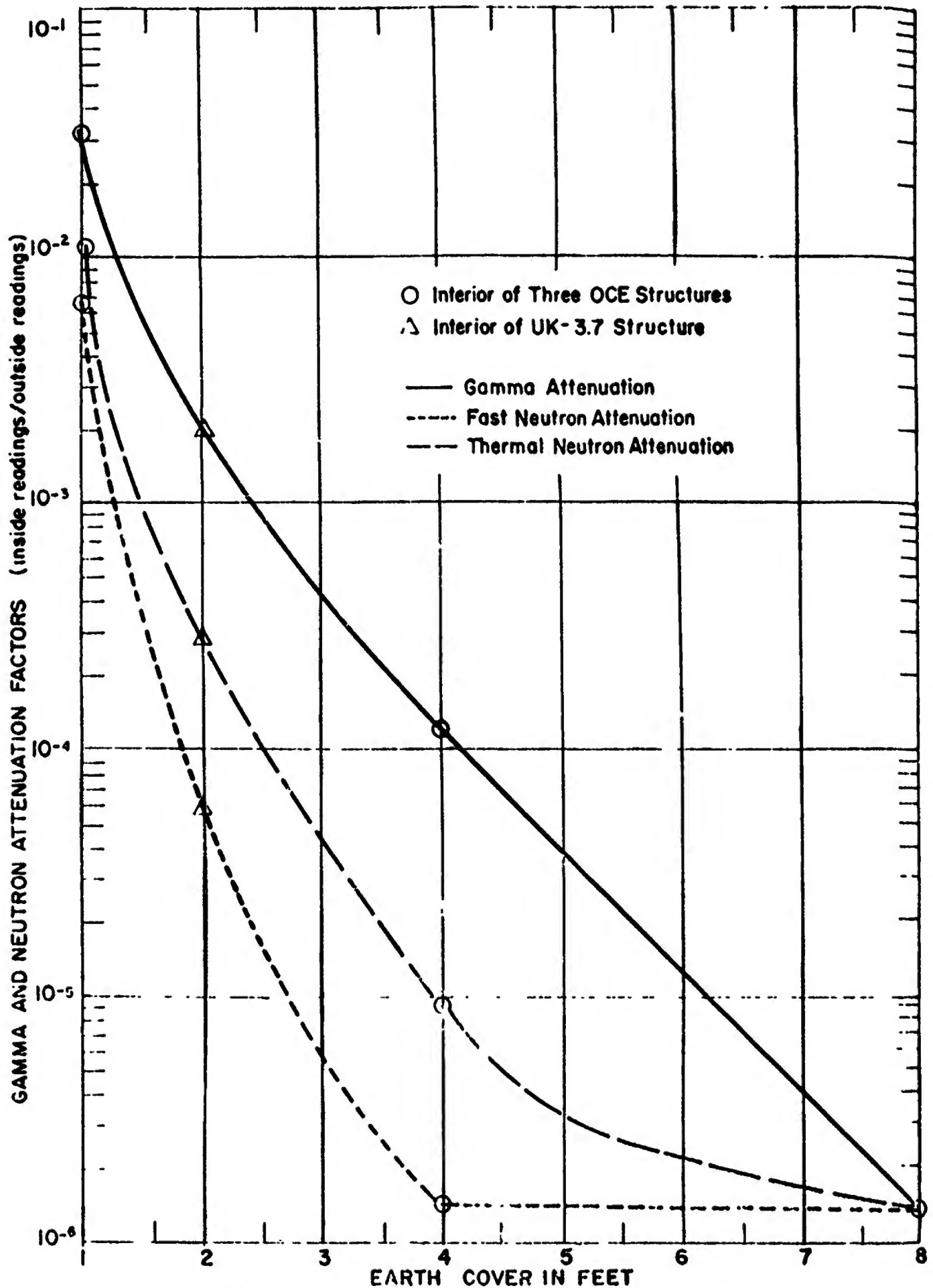


Figure 3.7 Gamma and neutron attenuation factors versus earth cover, Shot 12, 300 yards from ground zero. Outside gamma exposure, 307,000 r; outside thermal neutron flux, 6×10^{13} n/cm², outside fast neutron flux, 1.3×10^{13} n/cm².

HEARING ON CIVIL PREPAREDNESS AND LIMITED NUCLEAR WAR

WEDNESDAY APRIL 28, 1976

U.S. SENATE AND
U.S. HOUSE OF REPRESENTATIVES,
JOINT COMMITTEE ON DEFENSE PRODUCTION,
Washington, D.C.

The committee met at 10:05 a.m. in room 5302, Dirksen Senate Office Building, Hon. William Proxmire, vice chairman of the subcommittee, presiding.

Present: Senators William Proxmire and John Sparkman.

Senator PROXMIRE. The committee will come to order.

Today's hearing inaugurates a review by the Joint Committee on our Nation's civil preparedness. It is the first such congressional review in over two decades.

By civil preparedness, we mean those mainly civilian measures by which we seek to protect the lives and property of our citizens.

This is the first function of any government. A government which cannot meet this fundamental test of defending its people and the national treasure is not likely to survive for very long.

In subsequent hearings, the committee will examine the adequacy of Federal, State, and local preparedness programs, including plans for fallout shelters, strategic evacuation, preparedness exercises and drills, civil defense stockpiles, and continuity of government. Likewise, the Joint Committee will inquire into the organization of the Government for preparedness. It will also review the Nation's industrial and economic preparedness in terms of the defense industrial base.

This is an especially timely undertaking. Over the past 2 years the United States has been moving from a declared nuclear policy of mutual assured destruction to one of flexible response, or limited nuclear war.

In the minds of some eminent strategists, this implies a lowering of the nuclear weapons threshold, a quickening of the trigger finger on the missile launch console, and an increased probability of uncontrolled nuclear conflict.

But to other equally qualified experts, this shift in strategic doctrine, this shift to larger numbers of more flexible, or more versatile and accurate weapons and control systems does not undermine deterrence of nuclear war; instead, it enhances deterrence.

Well, it can't be both ways and whenever you have such a complete divergence in expert opinion, it is time for a careful review of the facts.

These hearings are also timely in that there are increasing rumors of a civil defense gap, with the Soviet Union well in the lead.

In this year's annual report, Defense Secretary Rumsfeld stated that, and I quote:

An asymmetry has developed over the years that bears directly on our strategic relationship with the Soviets and on the credibility of our deterrent posture. For a number of years, the Soviets have devoted considerable resources to their civil defense effort which emphasizes the extensive evacuation of urban populations prior to the outbreak of hostilities, the construction of shelters in outlying areas, and compulsory training in civil defense for well over half the Soviet population. The importance the Soviets attach to this program at present is indicated not only by the resources they have been willing to incur in its support, but also by the appointment of a deputy minister of defense to head this effort.

Now, the term "asymmetry" used by the Secretary sounds to a non-expert like me like a four-bit word for "gap." We have heard a great deal over the years about gaps that never materialized or proved unimportant. Yet we have spent a lot of money to eliminate the non-existent or the insignificant. It is for this reason that the committee last week published the declassified text of the 1957 Gaither Report which invented the first missile gap.

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**STATEMENT OF HON. PAUL NITZE, FORMER SECRETARY OF THE
NAVY, DEPUTY SECRETARY OF DEFENSE, AND MEMBER OF THE
SALT DELEGATION**

Mr. NITZE. Mr. Chairman, my interest in the questions which this committee is discussing began in 1944 when I was asked to be a director of the U.S. Strategic Bombing Survey. The required qualification of the directors was that they have no prior knowledge of military strategy or of air power, and could thus be presumed to be unbiased in appraising the effects of the immense U.S. strategic air effort in World War II. I spent the next 2 years in Europe and then in the Pacific in intensive work, in association with what I believe to have been the best talent available to this country, to try to understand something about both subjects. In the Pacific portion of the survey, as Vice Chairman, I was in effective command of the operation, including the detailed study of the effects of the weapons used at Hiroshima and Nagasaki.

Since that time much has changed. Weapons have increased in yield and missiles now have an intercontinental range. But these changes are hardly as revolutionary as the changes brought about by the role of effective air power in World War II and of the introduction of nuclear weapons in its closing phase. After all, the largest number of our nuclear reentry vehicles today are Poseidon warheads, each of which has an equivalent megatonnage less than twice that of the weapons used at Hiroshima and Nagasaki.

At Hiroshima and Nagasaki there was no air-raid warning and very few people availed themselves of the crude civil defense facilities which were available. Most of those that did, even at ground zero, in other words, directly under the explosion, which was at the optimum height of burst, survived. The trains were operating through Hiroshima 2 days after the explosion.

Let me paraphrase from an interchange I had in 1960 with Colonel Lincoln, head of the faculty at West Point, on this subject:

The Russians are careful students of Clausewitz. I do not believe they would ever ignore either the danger that a war once started might escalate to the full violence which the pure theory of war might indicate; on the other hand, they would never forget that war is a tool of policy and that every effort must be made to avoid letting it so escalate.¹

¹ In this connection the following quotation from *Communist of the Armed Forces* in November 1975 is pertinent: "The premise of Marxism-Leninism on war as a continuation of policy by military means remains true in an atmosphere of fundamental changes in military matters. The attempt of certain bourgeois ideologists to prove that nuclear missile weapons leave war outside the framework of policy and that nuclear war moves beyond the control of policy, ceases to be an instrument of policy and does not constitute its continuation is theoretically incorrect and politically reactionary."

On the other hand, I can well imagine that they might consider a controlled nuclear conflict in which significant military targets, but not urban-industrial targets, are the initial objects of attack, if they thought war unavoidable.

In conclusion, I would like to comment on this committee's print containing the Gaither Report of 1957.

I have now read that report for the first time in nearly 20 years. I am impressed—especially in light of the information then available to the Gaither committee—by the care and comprehensiveness of that committee's examination of the problems assigned to it for study. I note in contrast the cavalier imprecision reflected in the foreword prepared by this committee's staff.

It is not true that the Gaither Report ignored arms control, nor is it true that the report spoke of U.S. strategic inferiority as then a fact. To the contrary, the Gaither Report described the United States as then "capable of making a decisive attack on the U.S.S.R." In view of SAC's vulnerability "to a surprise attack in a period of lessened world tension," the Gaither Report also noted the U.S.S.R.'s capability to make "a very destructive attack on this country."

The report then observed, "As soon as SAC acquires an effective 'alert' status, the United States will be able to carry out a decisive attack even if surprised," and it anticipated that juncture "as the best time to negotiate from strength, since the U.S. military position vis-a-vis Russia might never be so strong again."

In attempting to disparage the Gaither committee's analysis, the staff foreword cites a subsequent estimate "* * * that at the time of the Gaither Report the Soviet Union probably had fewer than a dozen operational ICBMs." In fact, at the time of the Gaither Report—only a few weeks after the sputnik launching—the Soviet Union obviously had no operational ICBMs. The Gaither Report made no assumption to the contrary. Indeed, it postulated 1959 as the probable year the Soviet Union would first have operational ICBMs; in fact, they first became operational in 1960. What was crucial at the time was not only the question of how many ICBMs would be operational when, but even more importantly the question of the speed with which the U.S. Air Force could achieve adequate early warning facilities and an appropriate alert posture.

The Gaither Report focused attention on those questions.

STATEMENT OF HERMAN KAHN, DIRECTOR, HUDSON INSTITUTE

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It is not true that the Democrats raised the issue of a missile gap against the Republican administration. That was a Republican statement. The Republicans predicted the Russians would have 300 missiles by 1960. But at the same time, the Republican administration said this wouldn't make any difference, because we had 2,000 bombers and they were more important than 300 missiles.

The great contribution of the Gaither Report, as Paul just said, was to make clear that if the Soviets had 300 missiles and we did not have any kind of warning system, then we might not have 2,000 bombers, because they could be destroyed by a surprise attack while still on the ground.

I also made clear, that while the Soviets probably would not have 300 operational missiles in 1960, if they did have them, we would be in trouble—that is, despite the predictions by the Republican administration we did not think they had such a force—but we were not sure.

What does one do when the other side may be able to do something in the near future and if one waits until he is certain before reacting, it is too late, while if one reacts early it may turn out to have been unnecessary?

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Let me also make a remark about a release I saw from this committee which listed a series of predicted gaps which did not occur. In at least half the cases, people were rather clear that the gap might not occur, but they were not sure.

[Additional remarks:]

But they felt they had to worry about it ahead of time and even make some preparations because they could not afford to wait until all the facts were in.

Let me ask a question: What do you do if the other side exhibits a weapon system and has the production capability? You are not quite sure what he is going to do. Do you wait until he does it or do you worry about it?

In general this is a very complicated issue. In some cases, we almost have to make preparations ahead of time, even though they may be wasted. In other cases, we should wait until we are more sure; in still other cases, one just hopes for luck. But one should not, in my judgment, downgrade responsible officials who get concerned under such circumstances.

I might also draw attention to some studies done by Albert Wohlstetter. It is pointed out in these studies that in most cases, we have underestimated rather than overestimated U.S.S.R. future capability. I will ask that this report be sent to the committee.

If you look at the record, there has been more a problem of underestimation than overestimation. This is true in terms of the number of missiles the Soviets have had over time and in terms of Soviet capability on all kinds of other issues. We tend to remember the discussion when some hysterical people overstate the problem; then it turns out to be wrong. I would argue this is not at all the characteristic problem.

Probably an even better prototype for the situation we are thinking about is pre-World War II. After World War I, much of the world became sick of war, and war became "unthinkable" to most people, particularly in the victorious "Allied Powers." Strategists and publicists talked about poison gas and knock-out blows; they thought all the capital cities would be destroyed by poison gas in the first few days of a war. They did not understand the idea of limitations in warfare—of mutual deterrence even after hostilities have broken out.

When Hitler got elected in 1933, people became interested in larger defense budgets. Then he marched into the Rhineland and, of course, defense budgets increased slightly. Then there was the Anschluss and then Munich, and more substantial increases in military budgets. With the invasion of Czechoslovakia, everybody got deeply concerned. Then, finally, there was the invasion of Poland, the formal declaration of war and then 7 months of more or less "phony war." As a result there was opportunity on both sides for 7 months' of full-time war production, before the war really opened up.

We would argue that similar possibilities should be considered today. Nobody is interested in jumping into a nuclear war today. Nobody is going to want to execute the usual picture of nuclear war, in which each side presses every button and goes home. It is extraordinarily difficult to believe such a scenario.

It might happen. But I would be willing to bet, if this were a betting matter, 50 to 1 against it.

On the other hand, the situation might arise in which there was a declaration of war, followed by a phony war, or a serious confrontation in which there were credible threats of war. By the way, in such a confrontation, the following dialog tends to occur.

Both sides are saying to the other side, "There is absolutely nothing at risk which justifies this terrible danger to which we are subjecting each other and the rest of the world. It is clear that whatever we are arguing about is simply not worth the risk of a thermonuclear war. Therefore, one of us has to be reasonable—and it isn't going to be me."

Finally, a last point. When we write scenarios for nuclear war, we find it difficult to write a credible scenario which doesn't involve months or weeks of warning. I would guess we are as good at writing scenarios as anybody in the world. We have certainly written as many.

I want to warn the committee, on the other hand, that when we looked at World War I, we didn't find that scenario plausible. The mere fact we can't write a plausible scenario for a war doesn't mean it can't occur, because one can find historical examples to the contrary.

Nevertheless, every scenario we write for nuclear war involves days, weeks or months of tension. Evacuation, last moment mobilizations are extraordinarily possible. By the way, evacuations occur not as a result of secret intelligence or in any attempt to try to outrun the missiles or the bombers. The *New York Times* and the *Washington Post* provide the warning perhaps days before the attack. People or governments then get frightened and decide to decrease their vulnerability to attack. The idea is, can you exploit such warning if it is printed in the papers?

TYPICAL STRATEGIC MOBILIZATION SCENARIOS

Of the four scenarios given below, the first two are history, the third used to be the great fear of NATO, and the fourth is probably the great fear of the Warsaw Pact.

1. The "phony war," 1940 (5 months) :
 - (a) Pre-crisis arms competition (UK, France, Germany and the U.S.S.R.).
 - (b) A major series of political-military crisis—
 - Militarization of the Rhineland (1936) ;
 - Anschluss (Austria) (1938) ;
 - Sudeten crisis (1938-39) ;
 - War in Poland (1939).
 - (c) De-escalation and negotiation (antagonists began a rapid buildup fearing a resumption of full scale conflict).
2. Korea (1950-53) :
 - (a) Pre-war politico-military crises—
 - Soviet invasion of Iran (1946) ;
 - Soviet takeover of East European nations (1945-48) ;
 - Berlin blockade (1948) ;
 - Soviet intervention in Turkey and Greece ;
 - Soviet military buildup, post WW-II.
 - (b) Major turnabout in U.S. policy—
 - Factor of four increase in defense expenditures in 18 months ;
 - Massive emphasis on strategic preparedness, especially active defense.
3. Successful Soviet attack on W. Berlin and subsequent de-escalation.
4. Uprising in East Germany gets out of control and escalates.

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CHARACTERISTICS OF A SPECIAL MOBILIZATION SCENARIO: A FORMAL DECLARATION OF WAR BY THE U.S.

1. The declaration would have solemn and especially great significance for our enemies, allies, and neutrals.
2. The information transferred would have :
 - (a) Unambiguous factual content of great importance ;
 - (b) Undeniable implications and symbolism ;
 - (c) Highly uncertain interpretations or implications.
3. Its existence would preempt "ordinary" crisis negotiation and deny the stability of any recent *fait accompli*.
4. In some extreme crises it could be temporizing—a declaration is not a spasm response—and lead to deescalation of actual fighting.
5. But it implies a rapid response to any increased use of force.
6. It tends to force a decision by allies to cooperate actively.
7. It would justify many peripheral actions (blockades, interdiction, property confiscation, internment of hostile aliens, etc.).
8. It would tend to unify the national response—and increase defense spending enormously through mobilization.
9. It would convey the unambiguous message that a *formal* peace treaty will be required to settle all the important issues.

ROLE OF RESEARCH FOR MOBILIZING ACTIVE DEFENSES

1. Missile defense probably would be the most important and expensive effort.
 2. Lead-time reduction becomes extremely important.
 3. A program is required to facilitate rapid massive procurement of mutually reinforcing systems—
 - Boost phase interception ;
 - Mid course interception ;
 - Terminal interception.
 4. A capability may soon be needed to support a war in space.
 5. A capability is required for integration into other—high priority strategic mobilization programs—
 - Air defense ;
 - Civil defense.
- Major research objective: design systems which are highly effective, mutually supporting and which can be rapidly deployed at high levels of expenditure.

APPENDIX I

PAUL HENRY NITZE

In the spring of 1969, Paul Henry Nitze was appointed the representative of the Secretary of Defense to the United States Delegation to the Strategic Arms Limitation Talks with the Soviet Union; a position he held until June 1974, at which time he resigned.

Mr. Nitze resigned from his duties as Deputy Secretary of Defense on January 20, 1969, a position he had held since July 1, 1967, succeeding Cyrus R. Vance.

Mr. Nitze was serving as 57th Secretary of the Navy when he was nominated by former President Lyndon B. Johnson on June 10, 1967, to become Deputy Secretary of Defense. He was confirmed by the United States Senate on June 29, 1967.

The late President John F. Kennedy nominated Mr. Nitze to be Secretary of the Navy on October 14, 1963. At that time he was serving as Assistant Secretary of Defense (International Security Affairs), having assumed that position on January 29, 1961. He began his duties as Secretary of the Navy on November 29, 1963.

Graduated "cum laude" in 1928 from Harvard University, Mr. Nitze subsequently joined the New York investment banking firm of Dillon Read and Company. In 1941, he left his position as Vice President of that firm to become financial director of the Office of the Coordinator of Inter-American Affairs.

From 1942-1943, he was Chief of the Metals and Minerals Branch of the Board of Economic Warfare, until named as Director of Foreign Procurement and Development for the Foreign Economic Administration.

During the period 1944-1946, Mr. Nitze was Vice Chairman of the United States Strategic Bombing Survey. He was awarded the Medal of Merit by President Truman for service to the nation in this capacity.

For the next seven years, he served with the Department of State, beginning in the position of Deputy Director of the Office of International Trade Policy. In 1948, he was named Deputy to the Assistant Secretary of State for Economic Affairs. In August, 1949, he became Deputy Director of the State Department's Policy Planning Staff, and Director the following year.

Mr. Nitze left the federal government in 1953 to become President of the Foreign Service Educational Foundation in Washington, D.C., a position he held until January 1961.

Mr. Nitze is Chairman of the Advisory Council of The Johns Hopkins School of Advanced International Studies in Washington, D.C., and also serves on the Board of Trustees of the University. He holds memberships on the Board of Directors of Schrodgers, Inc., in New York, and Schrodgers, Ltd., in London, The American Security and Trust Company of Washington, D.C., Northwestern Mutual Life Mortgage and Realty Investors of Milwaukee, Wisconsin, and is Chairman of the Board of the Aspen Skiing Corporation.

HERMAN KAHN

Herman Kahn was born in Bayonne, New Jersey, in 1922. He received a B.A. from UCLA in 1945 and an M.S. in physics from the California Institute of Technology in 1948. He was associated with the Rand Corporation before becoming in 1961 the principal founder and director of the Hudson Institute, a research organization studying public policy issues, with headquarters in Croton-on-Hudson, N.Y. His international reputation as a strategic warfare analyst or, as the *New Republic* put it, one of "the prophets of strategic reality," is based on his work at the Institute and on his books: *On Thermonuclear War* (1960), *Thinking about the Unthinkable* (1962), *On Escalation* (1965 and, revised *Pelican*

STATEMENT OF E. P. WIGNER¹ FOR THE JOINT COMMITTEE ON DEFENSE PRODUCTION

¹Dr. Wigner is a Nobel Laureate and an emeritus professor of physics at Princeton University and has long been associated with civil defense issues. He edited a 1968 study *Who Speaks for Civil Defense?*

THE EFFECTIVENESS OF CIVIL DEFENSE

This writer became convinced of the possible effectiveness of civil defense measures when he served as a member of the General Advisory Committee to the U.S. Atomic Energy Commission.

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Are the U.S.S.R. and China the only countries with elaborate and well developed civil defense systems? No—most of the peace-loving countries also have such systems, based on blast shelters, and their yearly expenditures per person on such defense is about 15 times greater than ours. This has been, so far, about 40¢ per person a year. Incidentally, the Swiss civil defense repeats our President Kennedy's message: (Civil defense) "is insurance we trust, will never be needed"—its greatest accomplishment is, according to the Swiss, that it will *not* have to be used, that it will divert the aggressive instincts of possible opponents.

It is easy to conclude that an effective civil defense is not only desirable, it is also possible.

IS CIVIL DEFENSE NECESSARY?

What is the principal danger that threatens us in the present absence of an effective civil defense? It is the possibility of the U.S.S.R. evacuating its cities, dispersing their population, and then making demands on us, under the threat of a nuclear attack, approximating those made by Hitler or Czechoslovakia which led to the Munich pact. This left Czechoslovakia essentially defenseless.

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THE ARGUMENTS AGAINST CIVIL DEFENSE

The argument which we heard after the U.S.S.R. civil defense efforts became generally apparent was that our installation of protection for our people would only induce the U.S.S.R. to augment its aggressive capability. We now know that such augmentation took place even though we did not organize a vigorous civil defense effort. One of the two arguments we now hear, the civil defense is too expensive, seems almost ridiculous. If Switzerland, Sweden, etc., *even China*, can afford the more costly, the blast shelter method, we with the highest per capita national wealth, can also surely afford the defense of our people. The other argument, in the words of one of the most learned opponents of civil defense, S. Drell, is that it would lead to an "escalation of the apprehension from the mood of today, vis-a-vis the dangers of a nuclear exchange between the U.S. and the Soviet Union." Should the apprehension of the danger not be greater now, where we have no effective defense, than it would be when we have such defense? Or is it proposed that we should lull the common people into ignorance of the true situation? It is remarkable also that the U.S.S.R. is not criticised for fostering the "apprehension" of its own people. One must conclude that the varying arguments against civil defense have little validity.

A FEW PROPOSALS RELATED TO OUR DEFENSE

The first change I would advocate is to stop maintaining that a nuclear war would be the end of mankind. Such a statement may give the impression to an opponent that he can achieve anything by threatening with a nuclear war. After all, he would argue, the opponent (that is us) will make any sacrifice to avoid the "end of mankind". Hence, if he is threatened with extinction he will give in, particularly if the threat comes from a party which does not believe that the war precipitated by him will lead to the "end of mankind". Instead of such a blatantly incorrect statement, it would be better to subscribe to Chuykov's doctrine that "knowledge and the skillful use of modern protective measures" will make it possible to provide effective protection. At least, we could adhere to Kissinger's earlier (1957) statement: "While it (civil defense) cannot avert the traumatic effect of vast physical destruction, its efficient operation may make the difference between the survival of a society and its collapse."

The second measure which I consider to be urgent is to establish better contact with the people at large. This makes it desirable for DCPA to expand its staff by the employment of people who can establish a contact with the population at large, who can speak and write the truth convincingly. One of the functions of these advisors would be to help the high schools to give instruction on the nature of nuclear explosions and the defense against the effects of these. This is a subject which is foreign to most present high school teachers, and the advisor could and should help them to acquire the necessary knowledge. After all, the Federal Government now intends to support the local schools and can well suggest that these contribute to the protection of the country. The high school instruction on civil defense—obligatory in the U.S.S.R.—would be very useful since, after all, we learn best when we are young and we learn most non-elementary facts from our teachers. But even more generally, the establishment of a close contact between those who protect our freedom, and those whose freedom is protected, would be very desirable; and acquainting people at large with the methods and effectiveness of civil defense would provide an avenue toward this goal. It may not be easy to find people who know about the methods and effectiveness of civil defense and who are also able and interested in communicating this and much other knowledge to the people at large, but every effort should be made to find such people and support them.

The last suggestion I wish to make is that the DCPA budget should certainly not be cut. It should steadily be increased until, in a few years, it reaches the per capita level of other peace-loving and non-expansionist countries, such as Switzerland, Holland, Sweden, etc. For reasons given in the rest of my statement, this would be of decisive importance for maintaining a valid, widely endorsed, and vigorous defense effort for our country—and it would support all freedom-directed nations. Their independence does depend to a certain degree on our strength and our ability to stand up for them. The examples of Hungary, Czechoslovakia, Poland—to mention only a few—show that such independence does not come freely.

(Gross exaggerations, assuming Nevada desert type terrain with no thermal shadows by city skylines, no duck and cover, no clothing and fraudulent blast effects data which ignores Hiroshima's evidence)

APPENDIX III

U.S. CIVILIAN NUCLEAR FATALITY ESTIMATES¹ FOR VARIOUS COUNTERFORCE ATTACK SCENARIOS

Type of attack	Assumptions	Estimated fatalities
Comprehensive attack:		
Case 1, 60 percent destruction of military targets.	1 optimum height of burst and 1 surface burst warhead per each of 1,054 ICBM silos; pattern attack of SAC bases; unspecified attack on 2 SSBN support bases; good shelter posture.	3, 200, 000
Case 2, 60 percent destruction of military targets.	2 optimum height of burst warheads per each of 1,054 ICBM silos; no pattern attack of SAC bases; unspecified attack on 2 SSBN support bases; poor shelter posture.	6, 700, 000
Case 3, 57-60 percent destruction of military targets.	2 surface burst warheads per each of 1,054 ICBM silos; pattern attack of SAC bases; unspecified attack on 2 SSBN support bases; very poor shelter posture.	16, 300, 000
ICBM only attack:		
Case 1.....	2 550 kt optimum height of burst warheads per each of 1,054 ICBM silos.	² 4, 000, 000
Case 2, 42 percent silo destruction.	1 550 kt surface burst and 1 550 kt optimum height of burst warhead per each of 1,054 ICBM silos.	5, 600, 000
Case 3, 80 percent silo destruction.	1 3 Mt surface burst and 1 3 Mt optimum height of burst warhead per each of 1,054 ICBM silos.	18, 300, 000
Case 4.....	2 3 Mt surface burst warheads per each of 1,054 ICBM silos.....	³ 20, 000, 000
Airlift attack:⁴		
Case 1.....	1 200 kt cruise missile warhead per each of 5 U.S. heavy airlift bases (Dover AFB, Del.; McGuire AFB, N.J.; Travis AFB, Calif.; Charleston AFB, S.C.; and McChord AFB, Wash.)	70, 000
Case 2.....	1 1.2 Mt SLBM per each of 5 U.S. heavy airlift bases.....	210, 000
Case 3.....	1 1.2 Mt SLBM per each of 5 U.S. heavy airlift bases uses offset targeting.	135, 000

¹ Department of Defense estimates as reported to the Senate Foreign Relations Committee, July 11, 1975, and published in "Analyses of Effects of Limited Nuclear War," pp. 12-24. Note that figures are fatalities only and not casualties and that attacks are restricted to military facilities (counterforce) rather than populated areas (countervalue). Shelter posture is a function of degree of hardening and the willingness of the population to use shelters.

² Under.

³ Circa.

⁴ Assumes allied victories in a European war supported by U.S. military airlift provide incentives for destruction of major American airlift centers.

Nuclear War Survival Skills

Cresson H. Kearny

[Note: Kearny was inspired to write this by the USSR manuals like "Antiradiation shelters in Urban Areas", 1972, English translation: Oak Ridge Nat. Lab., ORNL-TR-2745.]

Oak Ridge National Laboratory
Oak Ridge, Tennessee

September 1979

Summary

Underlying the advocacy of Americans' learning these down-to-earth survival skills is the belief that if one prepares for the worst, the worst is less likely to happen. Effective American civil defense preparations would reduce the probability of nuclear blackmail and war. Yet in our world of increasing dangers, it is significant that the United States spends much less per capita on civil defense than many other countries. The United States' annual funding is about 50 cents per capita, whereas Switzerland spends almost \$11 and, most importantly, the Soviet Union spends approximately \$20.

In the first chapter the myths and facts about the consequences of a massive nuclear attack are discussed. As devastating as such an attack would be, with adequate civil defense preparations and timely warning much of the population could survive.

- **Myth:** Fallout radiation from a nuclear war would poison the air and all parts of the environment. It would kill everyone. (This is the demoralizing message of *On the Beach* and many similar pseudo-scientific books and articles.)
- **Myth:** A heavy nuclear attack would set practically everything on fire, causing "firestorms"

These exaggerations have become demoralizing myths, believed by millions of Americans.



HIROSHIMA. Typical, part below ground, earth-covered, timber framed shelter 300 yds. from the centre of damage

One appendix of the handbook gives detailed, field-tested instructions for building six types of earth-covered expedient fallout shelters, with criteria to guide the choice of which shelter to build. The design features of several types of expedient blast shelters are described in another appendix. Two others contain instructions for making an efficient shelter-ventilating pump and a homemade fallout meter that is accurate and dependable. Both of these essentials can be made with inexpensive materials found in most households. Drawings are used extensively, as are photographs of people actually building and living in the various shelters.

This first-of-its-kind report is primarily a compilation and summary of civil defense measures and inventions developed at ORNL over the past 14 years and field-tested in six states, from Florida to Utah.

- **Myth:** In the worst-hit parts of Hiroshima and Nagasaki where all buildings were demolished, everyone was killed by blast, radiation, or fire.
- **Myth:** Because some modern H-bombs are over 1000 times as powerful as the A-bomb that destroyed most of Hiroshima, these H-bombs are 1000 times as deadly and destructive.



NAGASAKI. Typical small earth-covered back yard shelter with crude wooden frame, less than 100 yds. from the centre of damage

PREVENTION OF THYROID DAMAGE FROM RADIOACTIVE IODINES

An extremely small and inexpensive daily dose of the preferred non-radioactive potassium salt, potassium iodide (KI), if taken $\frac{1}{2}$ hour to 1 day before exposure to radioactive iodine, will reduce later absorption of radioactive iodine by the thyroid to only about 1% of what the absorption would be without this preventive measure. Extensive experimentation and study have led to the Federal Drug Administration's approval of 130-milligram (130-mg) tablets for this preventive (prophylactic) use only. A 130-mg dose provides the same daily amount of iodine as does each tablet that English authorities for years have placed in the hands of the police near nuclear power plants, for distribution to the surrounding population in the very unlikely event of a major nuclear accident. It is quite likely that a similar-sized dose is in the Russian "individual, standard first-aid packet." According to a comprehensive Soviet 1969 civil defense handbook, this first-aid packet contains "anti-radiation tablets and anti-vomiting tablets (potassium iodide and etaperain)."

ЗАЩИТНЫЕ СВОЙСТВА МАТЕРИАЛОВ

Экспозиционную дозу радиации ослабляют вдвое материалы толщиной

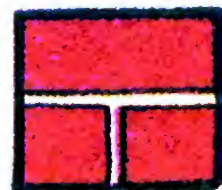
сталь — 4,7 см



бетон — 12



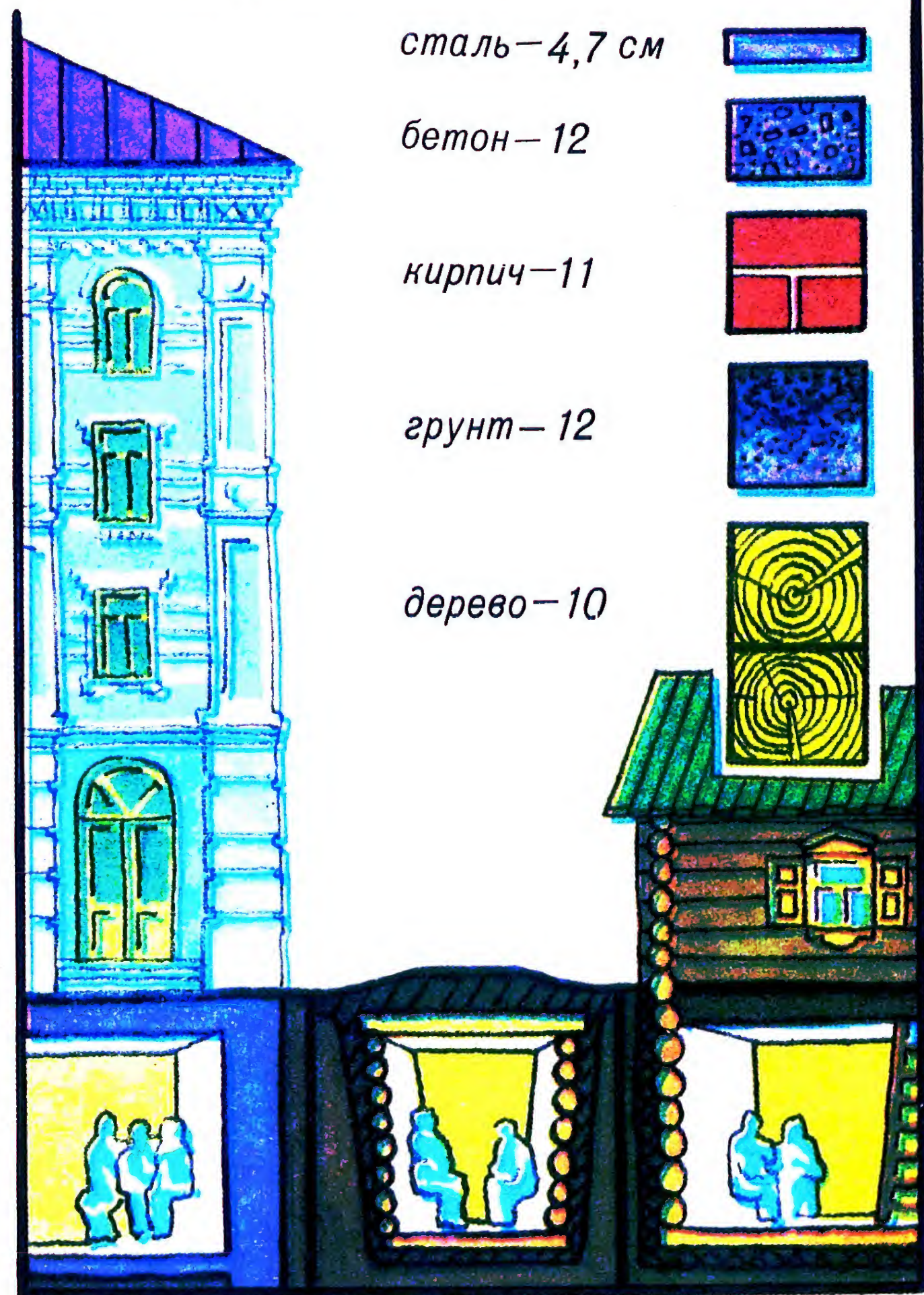
кирпич — 11



грунт — 12



дерево — 10



A diagram of a circular stop thread. A central ruler is positioned horizontally across the middle of the circle. The ruler has markings from 15 to 0 on the left and 0 to 15 on the right, with the unit 'MM' at the far right. The ruler is flanked by two vertical dashed lines. The text 'STOP THREAD' is written in the bottom right corner, with an arrow pointing to the right edge of the circle.

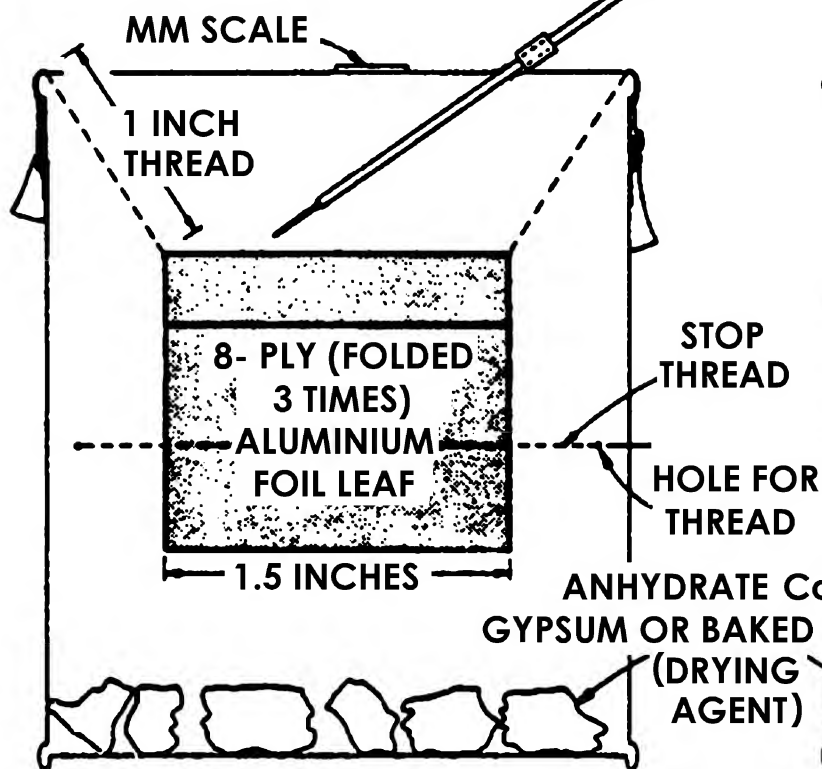
Reading in mm is difference in gap between aluminium leaves, before and after exposure

15 SEC 1 MIN 4 MIN 16 MIN 1 HR

Reading	R/HR	R/HR	R/HR	R/HR	R/HR
2 MM	6.2	1.6	0.4	0.1	0.03
4 MM	12	3.1	0.8	0.2	0.06
6 MM	19	4.6	1.2	0.3	0.08
8 MM	25	6.2	1.6	0.4	0.10
10 MM	31	7.7	2.0	0.5	0.13
12 MM	37	9.2	2.3	0.6	0.15
14 MM	43	11	2.7	0.7	0.18

2.5 INCH INSULATED CHARGING WIRE

TRANSPARENT PLASTIC COVER



ANHYDRATE CaSO_4
GYPSUM OR BAKED SILICA GEL
(DRYING AGENT)

Diagram illustrating the setup for a radiation ionized air discharge. The central component is a **THREAD** with a **0.4 INCH FOLD**. The distance between the **REPELLING CHARGED PLATES** is **1.25 INCHES**. The bottom of the setup is labeled **RADIATION IONIZED AIR DISCHARGES PLATES** and **SILICA GEL**.

RADIATION
IONIZED AIR
DISCHARGES PLATES

(IN >70% HUMIDITY USE IN DRY BUCKET)

METAL CAN WITH LID REMOVED

1 INCH



**Electroscope
fallout meter
is calibrated by
design geometry**

**During the October
1962 Cuban crisis
L. W. Alvarez made
can fallout meters**